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Student Perspectives in Advanced Placement for First-Year
and Traditionally Underrepresented Students:
Successes, Challenges, and Shifts in
Their Academic Identity

by

Teresa Ketelsen

A dissertation submitted in partial fulfillment
of the requirements for the degree of

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In
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2017

Student Perspectives in Advanced Placement for First-Year and Traditionally
Underrepresented Students: Successes, Challenges and Shifts in



their Academic Identity

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Teresa Ketelsen

This dissertation is completed as a partial requirement for the Doctor of Education (EdD) degree at the University of Portland in Portland, Oregon.

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Abstract

This study examined the perceptions of first-year Advanced Placement (AP) students; specifically traditionally underrepresented AP students from a high school that attempted to align its AP enrollment to the demographics of its school. This research contributed to the body of knowledge around first-year and traditionally underrepresented students participating in AP courses by identifying their perceived supports and challenges in their AP courses through a pre- and post-survey ($n = 81$) as well as selected student interviews ($n = 5$). The importance of this study is the student perspectives about the supports, the challenges, and their perceived changes that occurred in their academic identity while enrolled in the AP class.

The first phase of this research analyzed the marks students earned in their AP classes, scores from their AP exams, and survey data to identify student perceptions of supports and challenges in their AP classes. At the end of the first phase, changes in their perceived academic identity were analyzed from responses on pre- and post-surveys. The second phase of the research design included interviews of purposefully selected students to gain a deeper understanding of the findings from the first phase of the study.

The factor that most helped first-year students succeed was that their AP teacher believed they could be successful in the class. The quantitative survey data and student interviews revealed that students were challenged by the difficulty of content in AP classes, the amount of work, and managing their time. First-year AP

students exhibited statistically significant decreases ($p < .05$) from the pre- to post-AP survey in their perceptions of their academic self and academic strategies.

The results and implications from this study are discussed and may provide insight for suburban high schools that are experiencing a shift in student demographics to better meet the academic needs of all students in AP.

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Lastly, I thank God for helping me make it through experience.

Dedication

To my children, Jordin and Cade. I would not be who I am today if not for you. You are a continual source of inspiration.

Table of Contents

Abstract	iii
Acknowledgements	v
Dedication	vi
List of Tables.....	x
List of Figures	xi
 Chapter 1: Introduction	 1
Purpose of the Study.....	7
Significance of the Study.....	8
Theoretical Framework.....	9
Communities of Practice	10
Communities of Practice Illustrated	11
Trajectories	11
Summary.....	13
 Chapter 2:.....	 14
The Advanced Placement Program	14
AP Courses	15
AP Exams	16
Professional Learning for AP Teachers.....	18
Outcomes for Advanced Placement Courses.....	18
While in High School	18
AP and College Readiness Skills.....	22
AP and College Enrollment.....	24
AP and College Completion	25
History of Inequity in Public Education	27
Disparities in AP.....	30
Barriers to Student Enrollment.....	34
Expanding AP Opportunities for all Students	38
Low AP Exam Scores.....	42
Criticism of AP Expansion.....	43

Academic Identity.....	45
Summary.....	50
Chapter 3: Methodology	52
Research Questions.....	52
Rationale for Methodology.....	53
Context.....	54
AP Programming	56
Recruitment of AP Students	57
Participants	58
Design and Procedure.....	59
Phase One	59
Phase Two.....	60
Instruments	60
Survey	60
Interviews	63
Ethical Considerations.....	65
Role of Researcher.....	66
Data Analysis.....	66
Achievement Data	66
Survey Data	67
Interview Data	68
Phase Two Analysis Supports Phase One	69
Summary.....	69
Chapter 4: Data & Analysis	71
Research Question #1: Student Marks and Exam Scores in AP Courses.....	71
Research Question #2: Supports and Barriers for First-time AP Students.....	75
Elements First-Year AP Students Believe Helped Them Succeed.....	76
Student Reflections on AP Classes.....	77
Student Reflections on Classes Other Than AP	80
Being in an AP Class Compared to Other Classes	83
Research Question #3: Traditionally Underrepresented First-time in AP.....	85
Elements Traditionally Underrepresented AP Students Believe Helped Them Succeed	86
AP Class Experiences for Traditionally Underrepresented AP Students	88
Traditionally Underrepresented AP Students in Other Classes.....	90
AP Class Compared to Other Classes for Traditionally Underrepresented Students.....	92
Student Interviews	92

Research Question #4: Changes in First-Year AP Students Perceptions of Themselves	95
Survey Results	95
Student Interviews	99
Research Question #5: Enrollment in Another AP Course	101
Survey Responses	101
Student Interviews	105
Conclusion	106
Chapter 5: Discussion	107
Discussion of Findings	107
First-Year AP Student Performance	108
AP Class Experience for First-Year Students.....	109
AP Class Experience for Traditionally Underrepresented Students.....	111
Shifts in Academic Identity	115
Enrollment in Another AP Class	119
Implications for Practice.....	119
Limitations of the Study	122
Implications for Future Research	124
Conclusion	125
References	127
Appendix A: Post-AP Survey	136

List of Tables

Table 1: Demographics of Class of 2013 Graduates and AP Exam Takers.....	5
Table 2: Advanced Placement Courses.....	16
Table 3: 2015-2016 Student Demographics (9 th – 12 th Grades).....	55
Table 4: Participating School and District Student Performance.....	56
Table 5: Advanced Placement Course Enrollment in 2015-2016.....	57
Table 6: Number of Participants by Race/Ethnicity	59
Table 7: Learning Asset Descriptions	62
Table 8: Means for AP Class Marks and AP Exam Scores	73
Table 9: Pearson’s Correlation Coefficients for Marks and Grades	75
Table 10: Importance of Items in Helping First-Year AP Students Succeed	77
Table 11: First-Year AP Student Experiences in AP Class	79
Table 12: First-Year AP Student Experiences in Classes Other than AP	82
Table 13: Student Description of AP Class Compared to Other Classes.....	84
Table 14: Traditionally Underrepresented First-Year AP Student Supports	87
Table 15: Traditionally Underrepresented First-Year AP Student Experiences in AP Class	89
Table 16: Traditionally Underrepresented First-Year AP Student Experiences in Other Classes.....	91
Table 17: Mean Growth in Academic Identity	98
Table 18: Reasons Students Would Choose Not to Take Another AP Class.....	102
Table 19: Students Would be More Likely to Take Another AP Class if:	103

List of Figures

Figure 1: Identification with an Academic Domain.....	46
Figure 2: Explanatory Sequential Design Flowchart	54
Figure 3: Commonly Represented and Traditionally Underrepresented Advanced Placement Students	74
Figure 4: Means for Marks in AP Classes and AP Exam Scores.....	108
Figure 5: First-Year AP Student Response to the Statement “Compared to my Peers, I Feel I Have to Prove Myself to...”	111
Figure 6: First-Year Traditionally Underrepresented AP Student Response to “Compared to my Peers, I Feel I Have to Prove Myself to...”	114

Chapter 1: Introduction

Although the high school dropout rate has improved from 14% in 1972 to 7% in 2012 (Snyder, de Brey & Dillow, 2016), the adverse consequences for students who drop out are life changing. A 2009 study found that high school dropouts annually earned only 57% of high school graduates' earnings and only 34% of the earnings for those with a bachelor's degree (Khatiwada, McLaughlin, Palma, & Sums, 2009). In the same study, incarceration rates also were higher for high school dropouts. In the years 2006 and 2007, 6% of high school dropouts were incarcerated compared to 1% of high school graduates. These data are even more alarming when taking into account the disparity among high school dropout rates for Black, Hispanic, and White students (Snyder et al., 2016). In 1972 the national dropout rate for White students was 12%, whereas it was 21% for Black students and 34% for Hispanic students. Forty years later in 2012 these rates had decreased to 4% for White students, 8% for Black students, and 13% for Hispanic students (Snyder et al., 2016); however, the gaps between the subgroups have persisted. In Oregon, the dropout rate was higher in 2012 than the national rate: 14% of White students, 22% of Black students, and 21% of Hispanic students dropped out (Oregon Department of Education [ODE], 2013).

Over the decades schools have implemented a variety of strategies to increase graduation rates for all students and to reduce the graduation gaps between Black and Hispanic students and their White peers. Some of these strategies were to intensify the rigor of course requirements, upgrade curriculum to align with college or work readiness, and to expand access to advanced courses (Adelman, 2006; Attewell &

Domina, 2008; Edmunds & McColskey, 2007). One of the nation's leading programs for advanced coursework in high school is the College Board's Advanced Placement Program (AP), which offers rigorous, college-level curriculum and assessments to students while they are in high school. AP was created in 1954 to challenge talented students and move them to and through college. During this period, the need for this challenge was elevated since this was at the onset of the Cold War, which "required the so-called 'best and brightest' to meet the intellectual demands of political and scientific leadership" (Schneider, 2009, p. 815). The program began with just 18 participating schools and 532 students completing AP exams in 1954 (Schneider, 2009). According to Schneider, in the 1970s educational leaders saw AP as a catalyst for school reform in underserved communities. This triggered a surge in the number of schools offering AP courses. In 2012 78% of all public high schools, 18,920 schools total, offered AP courses, and over 2 million students completed AP exams (College Board, 2015; National Center for Education Statistics, 2016a). AP has steadily grown since the beginning of the program, but a steeper growth trajectory occurred in the last 20 years, from just over 500,000 students taking an AP course in 1994 to nearly 2.5 million student participants in 2014 (College Board, 2015). The remarkable growth of the AP program is largely driven by student demand and district or school policies to provide access to AP classes to more students (Farkas & Duffett, 2009).

The benefits of participating in AP are vast. Recent research shows students who participate in AP courses and take the corresponding AP exams have higher grade point averages in high school, have higher graduation rates, and are more likely to go

to college than students who did not participate (College Board, 2014; Conley, McGaughy, Davis-Molin, Farkas, & Fukuda, 2014; Long, Conger, & Iatarola, 2012). Students who take advanced courses such as AP while in high school are consistently exposed to high expectations, experience a preview of college courses, and can even earn college credit or have entry level college courses waived (College Board, 2014). Students who are successful on the exit exams in advanced courses gain confidence in their academic abilities and strengthen their persistence and their ability to tackle difficult situations (Conley et al., 2014; Long et al., 2012).

Even with these proven benefits, the disparities in enrollment in AP courses are similar to those of high school graduation between Black and Hispanic students and their White peers. Schneider (2009) characterizes “the history of Advanced Placement in the United States as a tug-of-war between those struggling to secure equity for all and those intent on securing a measure of distinction for some” (p. 813). In this case, equity gaps occur when the percentage of students from a particular race or ethnicity that took AP exams is smaller than the same race or ethnicity’s percentage of the graduating class for any given year (College Board, 2014). For instance, in 2003 Black students represented 13% of the graduating class, but only 6% of the students who took AP exams were Black, signifying a 7-point equity gap. By 2013 this equity gap decreased to 6 points with 15% of the graduating class in the Black subgroup and 9% of the students who took the AP exam being Black. In 2013, an equity gap for AP participation for Hispanic students did not exist nationally. At the state level in Oregon, the percentages are similar for Black students; however, a gap for Hispanic students did exist. In 2013 17% of the graduates were Hispanic, but only 10% of

students enrolling in AP courses and completing the AP exam were Hispanic resulting in a 7-point equity gap (College Board, 2014). Table 1 shows these participation gaps nationally and specifically in Oregon.

The equity gap is not just based on race and ethnicity. Reardon (2011) found that parental income and educational levels are the best predictors of high school success. This equity gap based on socioeconomics plays out in AP enrollment as well. Students from higher socioeconomic families enroll in courses with more demanding curriculum than students who come from lower socioeconomic families (Klopfenstein, 2004). The same equity gap that exists for Black and Hispanic students and their White peers is present for students from low-income families and students from middle to high-income families.

In the absence of a national data source identifying students who come from low-income families, College Board uses free or reduced-priced lunch eligibility from the National Center for Educational Statistics. These percentages, shown in Table 1, represent all K-12 public school students, not just the graduates of 2013, so the percentages could be skewed. The percent of low-income students who took AP exams is also based on student eligibility for free or reduced-priced lunch. Even though the gap may not precisely reflect the percentage of graduates who came from low-income families, it does provide a comparison between Oregon and the nation.

Table 1

Demographics of Class of 2013 Graduates and AP Exam Takers

	White	Black	Hispanic	FRL
National				
Overall Graduating Class	58%	15%	19%	48%*
Overall AP Exam Takers	56%	9%	19%	48%
Participation Gap	2%	6%	0%	0%
Oregon				
Overall Graduating Class	71%	3%	17%	51%*
Overall AP Exam Takers	70%	2%	10%	22%
Participation Gap	1%	1%	7%	29%

Note. FRL stands for Free and Reduced Lunch; * indicates that values represent all students, not just graduates. All data is from College Board, 2014 except Oregon's overall graduation rates for White students, which was obtained from Oregon Department of Education's 2012-13 Cohort Media File, <http://www.ode.state.or.us/search/page/?id=2644>.

The approach schools take for enrolling students in AP courses will need to change in order to close these equity gaps (Dougherty, Mellor, & Jian, 2006). AP should not be a special set of courses for already well-prepared students, but a comprehensive program to prepare large numbers of students to complete college-level work before they leave high school. As seen in the rapid increase in the number of students enrolling in AP courses, the movement to open access to AP courses is growing across the nation. Approaches to AP expansion differ across schools. Of the high schools that offer AP courses, nearly 35% have an open access policy, allowing any student to enroll in any AP course (Farkas & Duffett, 2009). Some high schools automatically enroll all students into at least one AP course during their junior or senior year. Schools that have taken this approach must clearly communicate the benefits of AP participation with students and their families and provide a variety of

supports for students who need them. Other schools bring in programs that target students to enroll in advanced content courses who would be the first to attend college in their families. Often these targeted students are from disadvantaged backgrounds and are underrepresented in rigorous courses. These programs provide structures of support to assist students in successfully learning content. Some examples of these are the federal TRIO program, or private programs such as College Possible and Advancement Via Individual Determination (AVID). Equal Opportunity Schools (EOS) leads another approach for AP expansion by focusing on closing the AP participation gap for traditionally underrepresented groups of students (Theokas & Saaris, 2013). EOS staff facilitates identification and targeted recruitment of the “missing” AP students. These students have indicated through performance in their classes and on state-level assessments that they have the potential to be successful in an AP class but are not yet enrolled. Whatever strategies are being used, identifying and enrolling more students in AP is only the beginning. As students are placed into advanced courses for the first time, extra supports may be necessary to overcome the academic and potential social barriers they face (Attewell & Domina, 2008).

A potential challenge for students who have not considered enrolling in advanced coursework in high school is their feeling like they do not fit into the class community in AP courses. Students’ views of their academic skills and strategies, and their sense of belonging in their educational environment shape a student’s academic identity (Faircloth, 2009; Matthews, Banerjee, & Lauermaun, 2014; Osborne & Walker, 2006). This identity is formed through their internal perceptions as well as from the external feedback they receive from others about themselves as a student

(Matthews et al., 2014). A student's academic identity either supports or hinders active participation and engagement in school (Faircloth, 2009; Matthews et al., 2014). Students' perceptions that they are capable of achieving in AP and their active participation throughout the AP class are critical to their success.

Current literature exists on the alignment of students' participation in an AP class and their potential success in college level courses (College Board, 2014; Flores & Gomez, 2011; Theokas & Saaris, 2013). There have been previous studies on the access to and success in AP for Black students (Corra, Carter & Carter, 2011; Klopfenstein, 2004), Hispanic students (Ndura, Robinson, & Ochs, 2003; Walker & Pearsall, 2012), and students who come from families in poverty (Attewell & Domina, 2008). There also have been case studies on small numbers of Black or Hispanic students who participate in AP courses (Calaff, 2008; Kanno & Kangas, 2014; Walker & Pearsall, 2012). It does not appear, however, that any research has been conducted as a larger survey study for underrepresented students on their perceptions of supports and barriers they experienced while in their first-year of AP and how their academic identity changed during this time.

Purpose of the Study

The purpose of this mixed-methods study was to explore the perceptions of first-year AP students and traditionally underrepresented students enrolled in an AP course. The specific perceptions investigated included: (a) the supports and challenges associated with participating in the AP course, and (b) shifts in their academic identity while enrolled in the AP course. The overarching questions for this study were:

1. How does student performance in Advanced Placement courses differ for traditionally underrepresented AP students compared to commonly represented AP students?
2. For students who are enrolled in Advanced Placement courses for the first time, what elements do they believe caused them to successfully complete the course or interfered with their success?
3. Are these elements different for first-year traditionally underrepresented and commonly represented AP subgroups?
4. What changes occur in how students see themselves as academic individuals during their first year in an Advanced Placement course?
5. After completing their first year of an Advanced Placement course, what percentage of students plan to enroll in another Advanced Placement course?

Significance of the Study

This research is unique and contributes to the body of knowledge around first-year and traditionally underrepresented students participating in AP by identifying their perceived supports and challenges in their AP courses. This is done through pre- and post-surveys as well as selected student interviews. The high school in this study was purposefully sampled because they actively recruited students for AP classes that were performing well in their other classes and were not yet enrolled in AP. The importance of this research is the student perspectives about the supports and challenges they experienced. Many of the first-year students had not been planning on taking an AP course but were recruited to enroll in AP for the first time. Ultimately, this research identifies promising practices for student populations that are often

underrepresented in AP courses and informs programming, instruction, and needed supports. Results from this study provides guidance for suburban high schools that are experiencing a shift in student demographics to better meet the academic needs of all students in rigorous coursework, such as AP, as they improve their school's graduation rates and college-readiness culture.

Theoretical Framework

Historically, enrollment in AP courses has been reserved for middle to upper class White students whose future plans included attending college (College Board, 2014; Klopfenstein, 2004). Many students from underrepresented subgroups had not participated because they do not see college as an option, or they do not identify with the students who are taking the courses. Not identifying with other students in the AP class hinders the ability of students from underrepresented subgroups to be part of the class community. This study is framed through the lens of social learning theorist Etienne Wenger's (1998) communities of practice. Wenger states "today's learning institutions assume that learning is an individual process, that it has a beginning and an end, that it is best separated from the rest of our activities, and that it is the result of teaching" (p. 3). Within the context of social learning theory, the learning in schools described above only takes into account a portion of student learning. It does not include learning that occurs from the experiences of students outside of the school. Wenger's communities of practices and the trajectories students use to move into, within, and out of these communities are pertinent to high school populations as well as the community within the AP class.

Communities of practice. Wenger's communities of practice (1998) provides a conceptual framework that explains how learning occurs as individuals are active participants within the practices of social communities. These communities of practice allow them to build their identity in relationship to the community, as well as help the community as a whole, thus defining the term "communities of practice." A community of practice is a group of individuals who align on three dimensions according to Wenger. The first component is mutual engagement. Members in a community of practice may not be similar initially, but because they are mutually engaged in what matters to the community, commonalities become apparent. The level of mutual engagement may vary within the community from person to person. Challenges and disagreements arise within a community of practice as each individual member's identity interacts with others and is renegotiated inside the community of practice. Each member of the community of practice is fueled by engagement in the work of the community; yet, each is on his or her own unique trajectory within the community.

The second characteristic providing coherence to a community of practice is joint enterprise. This results from the continuous process of negotiating the collective activity that occurs within the community of practice. The term "joint" does not mean that all members necessarily agree on everything; rather, it means that much effort is put into commonly negotiating and defining the endeavor of their community. This is not a static agreement. Members generate the process as their trajectories move them throughout the community of practice in order to keep the community moving forward. Mutual accountability is built into the joint enterprise, because the

appropriateness of what members of the community do is determined through shared practice within the community (Wenger, 1998).

The third characteristic is a shared repertoire. The community of practice creates symbols for shared aspects that the community produces such as routines, goals, artifacts, and tools (Wenger, 1998). The repertoire that is based on these symbols can be ambiguous, providing an opening within the community to create shared meaning. In negotiating the shared meaning, an opportunity arises to dive into the process of strengthening the joint enterprise.

Communities of practice illustrated. There are two levels of communities of practice represented within this study. The first is the school level. It is within the school community of practice that access to AP courses for students exists.

Determining the number of AP courses to offer and deciding who can enroll in these courses are examples of the shared repertoire. Their joint enterprise is to provide students with a rigorous and relevant education to prepare them for their future beyond high school. Together, staff and students are mutually engaged in the work that is important to move forward with this joint enterprise.

The different communities of practice created by each AP class are the second level. Within each class period a group of students and a teacher are mutually engaged to be successful as individuals and as a whole group. They may not always agree, but the members are constantly negotiating what should be the joint enterprise of the class. At this level the shared repertoire includes the common experiences of the students, the assignments and activities in which they were engaged, and the systems they developed to support each other.

Trajectories. As stated earlier, not everyone participates in the community of practice in the same way. Wenger (1998) uses the term “trajectory” to describe how identities are negotiated as individuals flow through engagement practices within the community. A person’s trajectory is not a fixed path, but a path that is continuously moving and evolving as identity is negotiated through participation and experience. This trajectory provides coherence by connecting the past, the present, and the future. Wenger’s trajectories are influential in understanding how learning and identity are intertwined. It re-conceptualizes learning from something that is only done internally, in the person’s head, to incorporate engagement, participation, and membership within a community of practice.

Wenger’s (1998) trajectories are divided into five categories and each is salient to this research. On a peripheral trajectory, students are not fully participating in the work of the class community, which in turn limits their learning. Inbound trajectories are at the heart of this research. Since the focus of the study was on students who had never taken an AP course before, they were the newcomers. Throughout the school year, these newcomers’ inbound trajectory evolved into an insider, periphery, or outbound trajectory. Students on the insider trajectory had full participation within the community. Some first-year AP students may have been on an outbound trajectory at some point during the school year. This trajectory may have been their choice because the course was not what they expected or others in the community may have made the choice for them. Whatever the reason, they were headed to a new community of practice. Boundary trajectories were also valuable in understanding how students new to AP classes were spanning multiple communities of practice. This AP course was

only one of the classes they were taking. Sustaining their identity as they span the various communities of practice that they are a part of required a delicate balance.

Summary

This chapter provided an overview of the role AP courses play in increasing graduation rates and preparing students for their future beyond high school. It also highlighted the equity gap that exists in AP participation across the country for Black students, Hispanic students, and students who come from families with low socioeconomic status. To fill the described research gap, this study will investigate student perceptions regarding the supports and challenges they experience. The summary of these perceptions will inform suburban high schools as they determine supports for their AP programming.

Chapter 2 presents a review of the literature pertaining to this study, specifically describing how participation in AP will benefit students while in high school and in college, the disparities that exist in equitable access to AP, and strategies to identify barriers and put supports in place to increase student access. Relevant literature will also be reviewed on the development of a student's academic identity. Chapter 3 describes the planned research methodology, data collection, and analysis used in this mixed-methods study. Chapter 4 will provide the analysis results for each of the five research questions. Finally, a discussion of the findings and their implications in an educational setting will be provided in Chapter 5.

Chapter 2: Review of the Literature

The purpose of this chapter is to provide a review of literature and research connected to this study. This literature review will first identify the benefits of participating in advanced courses while in high school, specifically focusing on the connection of AP courses to the development of college readiness skills and their association to college completion. Then an overview of the inequities that exist in education for minorities and impoverished students will be provided, including disproportionate access and participation rates for these students and their White peers in AP courses. Barriers to enrollment in AP courses for underprivileged students and supportive practices to offset these barriers to increase access to the most rigorous courses in high school will be highlighted. Finally, how a student's academic identity is formed through simultaneous processes that involve internal reflection and external perceptions will be reviewed, while associating this development with Black, Hispanic, and low socioeconomic students to the AP community within their high schools.

The Advanced Placement Program

During high school, students and their families are faced with many curricular choices. The course selections they make not only affect their high school years, but also have a post-secondary impact. "Advanced coursework in high school is designed to differ from regular coursework in content coverage and intellectual demand" (Sadler, 2010, p. 51). As one of the nation's most common programs for advanced coursework while in high school, the Advanced Placement (AP) program is offered in nearly 80% of all public high schools (NCES, 2016a).

AP courses. Through the completion of a yearlong AP course, students experience the academic rigors of a college environment (College Board, 2004; Klopfenstein, 2004; Kyburg, Hertzberg-Davis & Callahan, 2007; Sadler, 2010). Based on the size of the school, resources available, and demand for advanced classes, the number and variety of AP courses that participating high schools offer range from just a few to the full spectrum of 38 AP courses available, shown in Table 2 (College Board, 2014).

In order to build consistency into AP courses throughout participating high schools, the College Board provides a subject specific AP program course outline that is developed by a committee of secondary school educators and college professors from across the country (College Board, 2004). Even though the outline includes prescribed content standards, there are no required texts for AP courses. However, there are suggested college level texts available on College Board's AP website for educators to use in their AP courses. Based on survey results of over 1,000 AP teachers (Farkas & Duffett, 2009), the overall quality of the AP program is still strong, despite its rapid growth. Over 75% of teachers surveyed rated their school's AP programs as good or excellent, reporting little change in the rigor, exam integrity, and student scores over the past few years.

Table 2

Advanced Placement Courses

Content Area	Advanced Placement Course	
Science	Biology	Physics 1
	Chemistry	Physics 2
	Environmental Science	Physics C: Mechanics
	Physics C: Electricity and Magnetism	
Math & Computer Science	Calculus AB	Computer Science A
	Calculus BC	Computer Science Principles
	Statistics	
English	English Language and Composition	
	English Literature and Composition	
History	European History	World History
	United States History	
Social Science	Psychology	Macroeconomics
	US Government and Politics	Microeconomics
	Human Geography	
	Comparative Government and Politics	
Arts	Art History	Studio Art: 3-D Design
	Music Theory	Studio Art: Drawing
	Studio Art: 2-D Design	
World Languages	Chinese Language and Culture	Japanese Language and Culture
	French Language and Culture	Latin
	German Language and Culture	Spanish Language and Culture
	Italian Language and Culture	Spanish Literature and Culture
AP Capstone	AP Seminar	
	AP Research	

Note. Taken from the College Board's *The 10th Annual AP Report to the Nation* from February 11, 2014.

AP exams. Each AP course has a corresponding standardized exam, which is given in May to assess students' knowledge and skills. Exam scores not only provide a school or district with student achievement data, they also provide information about

the quality of the AP program in a school. It is not mandated by the College Board that all students take the AP exam at the end of the course, but many districts require the exam, providing students an experience with a college-level assessment. Students' performance on the AP exams provides data back to the school for refinement of the AP program. Currently, the cost for each exam is \$93. Based on the socioeconomic level of a student's family, they may qualify for a \$31 fee reduction from the College Board. Further reductions are also provided from state funding to lower socioeconomic students at each school offering AP courses. The cost of the exam can be a deterrent to students and families if they do not understand how to apply for and access these fee reductions.

There are two sections in the exam: multiple-choice objective questions and subjective essay-based questions. Trained scorers grade the essay portion of the exams using a standardized rubric. The scores from the two sections are combined and converted into a 5-point scale to represent how well the student mastered the content and to what extent the student would be ready for the next college level course when they enroll in college. Students who score a 5 are deemed as *extremely well qualified*, scoring a 4 shows that they are *well qualified*, scoring a 3 demonstrates they are *qualified*, a score of a 2 represents *possibly qualified*, and scoring a 1 means there is *no recommendation* on the student's readiness for the next college level course. Scores of 3 and above are accepted for college credit at many colleges and universities throughout the country (College Board, 2014), saving students and their families college tuition dollars (Adelman, 2006; Calaff, 2008; Foust, Hertberg-Davis & Callahan, 2009). Through a survey of 1,000 current AP teachers, Farkas and Duffett

(2009) found that 86% believe AP exams are effective safeguards to the quality of AP courses and that they are well aligned to the curriculum and course objectives.

Professional learning for AP teachers. Specific training is not required to be an AP teacher; however the College Board organizes workshops throughout the country as well as an annual conference each summer to provide training for teachers who teach AP classes. According to their workshop catalog, those who participate review course outlines, view samples of student work, and gain a deeper understanding of the scoring guidelines used on the AP exam in their content area. They also cover pedagogical techniques and strategies to be used in the AP classroom. A registration fee is charged based on the length of the training. Some states, such as Texas, pay the cost for AP teachers to attend an AP-approved training (Klopfenstein, 2004). In order to support teacher collaboration, the College Board has also created an online AP teacher community with free access for any educator (for more information see <https://apcommunity.collegeboard.org>). Through this online community, AP teachers can connect with each other, exchange ideas, and share resources.

Outcomes for Advanced Placement courses

Students who participate in college-level courses while in high school experience benefits extending beyond their high school years.

While in high school. High school students are said to be more academically prepared and better equipped for their post-secondary endeavors if they successfully complete courses that have high levels of academic intensity (Adelman, 2006; Attewell & Domina, 2008; Long et al., 2012; Rodriguez, McKillip, & Niu, 2013). AP courses in high school provide an environment with rigorous learning opportunities, which can

be beneficial for all students who participate. The standardized course outline and exams, along with professional learning for AP teachers, promote higher-level thinking strategies used to stretch student learning.

Through a large-scale longitudinal study of Florida's public high school students who enrolled in Florida universities from 1997 to 2007, Long et al. (2012) found that students who took an advanced course by 10th grade were 7 to 11 percent more likely to attend a four-year college after graduating. "These results suggest that requiring or encouraging students to enroll in even one rigorous course in the first two years of school can substantially improve graduation and 4-year college enrollment rates" (Long et al., 2012, p. 315). Students whose advanced course was in mathematics had an on-time high school graduation rate 10% higher than their peers who did not take an advanced math course (Long et al., 2012). When disaggregating by race and socioeconomic status, the graduation rate was higher overall for students who took advanced courses, and was slightly higher for Hispanic, Black, and low-income students compared to White students. However, these results were only statistically significant ($p < .01$), for Hispanic students who took advanced math. Even though these findings are encouraging, concluding that higher graduation rates were because students participated in an advanced course is not advisable. Student maturation as well as events that happened during their high school years may have been a factor in the rate of graduates.

Rodriguez et al. (2013) supported this research in their study of high school graduates from 2010 from across the United States who had taken an AP exam in their 11th or 12th grade years. Within this group, they compared the performance of the

136,000 students who had taken an AP exam in 10th grade to those who had not taken the AP exam. The results were statistically significant ($p < .001$), showing that being exposed to AP courses and exams early in their high school years, even without earning a proficient score of 3 on the AP exam, was associated with a student's likelihood of taking an AP course and exam later in high school. Not only did this increase the overall rigor of their high school course load, it also increased their options post-graduation. The 10th grade students in this study who were not proficient on exams were not dissuaded from enrolling in a future AP course. Specifically, in the Rodriguez et al. (2013) study, students who earned a 1 or a 2 on the AP exam in 10th grade in Biology, U.S. Government and Politics, U.S. History, or European History were significantly ($p < .001$) more likely to score a 3 or higher on a later AP exam during high school.

These positive effects may carry over to standardized test performance, as well. In a study of over 425,000 high school students, McKillip and Rawls (2013) identified a strong relationship between AP exam participation and subsequent SAT performance. Students who scored a 3 or higher on an AP exam had higher SAT scores when compared to non-AP students. Contrary to the previous study where positive outcomes were found for students who received a 1 or 2 on the AP exam, students who scored a 1 on their AP exam or did not take the exam at all, performed worse on their SAT exam than students who had not taken an AP class (McKillip & Rawls, 2013). Two possibilities were offered on why students who scored lower on the AP exam were not benefitting from the AP course compared to their higher performing peers. First, students who score higher may be more academically

motivated, driving them to push themselves to achieve. Another possibility is that some teachers may do a better job than others of preparing students for the AP exam (McKillip & Rawls, 2013). This is supported by McKillip and Rawls in their research gained from analyzing the AP exam scores for all of the students in each AP class. In some instances, the AP exam scores for one teacher's students were clustered around lower AP exam scores, while students from another teacher were clustered around higher AP exam scores. Dougherty et al. (2006) argue that upgrading only the intensity of the curriculum in a high school will lead to course credit inflation rather than real skill improvements. Their research indicated that teacher training on the uses of the curriculum and how to make the content accessible to students with a variety of skills and abilities must also occur.

Not all researchers are in agreement with these previously stated benefits. Attewell and Domina (2008) caution that it is unwise to infer causation from studies positively linking the level of rigor in high school courses with a student's success while in high school. Instead of one causing the other, many students enroll in advanced classes and go to college because they have strong reasoning skills, are more motivated, or they may come from families that have an expectation that they go to college. Using the data from NELS88, a longitudinal study from National Center for Educational Statistics that reviewed the data of students from 1988 to 2000, Attewell and Domina (2008) found the curricular intensity was weakly linked to increased student test scores and graduation from college. Sadler and Sonnert (2010) argue that the decision to take an AP course is a form of self-selection. Students who are drawn to these challenging courses demonstrate the highest motivation and are the most

academically successful in high school. It is difficult to tell whether the students' performance in college was a result of participating in an AP course or if the performance was due to traits already within the student (Sadler & Sonnert, 2010).

All of the benefits mentioned so far have focused on academic gains. Foust et al. (2009) conducted focus group interviews of 84 AP students on the non-academic benefits of participating in advanced courses while in high school. Students noted a better atmosphere for learning in AP classes than other general education classes. Their perception was that AP teachers were better prepared, had more experience, and interacted more respectfully with students than their non-AP teachers. They also identified that they had more common academic interests with other AP students, which created a focused learning environment where they did not fear being judged or labeled for answering questions or pushing themselves academically (Foust et al., 2009).

AP and college readiness skills. Conley (2007) defines college and career readiness as the capacity to enroll and succeed in credit bearing courses at a post-secondary level without the need for remediation. College readiness is more than an adequate grade point average and a high school transcript with the titles of courses a student took. Conley (2007) suggests four key components of college readiness:

- Students must develop important cognitive strategies including thinking analytically and logically, comparing and contrasting different methods and philosophies, and understanding and analyzing conflicting explanations of phenomena or events. Students will need to apply each of these across all content areas while in college.

- Students must be able to think critically and apply the necessary content knowledge and skills.
- Students must develop self-management skills. In college, students must organize themselves to meet competing deadlines and priorities. They must be able to study independently and know when and how to seek academic support services.
- Students must have significant knowledge about postsecondary education. They need to match their personal interests with college majors and programs, understand financial aid programs, complete all required admission exams, applications and essays, and understand the differences in the culture of high school and the culture of college.

According to Conley et al. (2014), these key components of college readiness are developed within students as they participate in advanced courses during high school. Evidence of these key components are higher scores on college placement tests, developed critical reading skills, experience with high-stakes exams, and increased preparation for the rigor and expectations in college courses.

Hungerford-Kresser and Amaro-Jiménez (2012) expand Conley's components of college readiness to include a fluid and complex development of an identity process. Most often, going away to college is the first time students have been away from their home for an extended period of time. Their study identified that college students experience specific challenges in that first year with conceptualizing time management, locating and using resources effectively, and understanding expectations of the professors.

In addition, to develop college-going identities, Hispanic students also demonstrated a strong need to find similarities among themselves and others for a sense of solidarity (Hungerford-Kresser & Amaro-Jiménez, 2012). According to AP students who participated in focus group interviews, they felt a connection with their classmates in their AP courses that they did not experience in other courses (Foust et al., 2009). This connection grew through a high level of motivation and similarity in academic interests, maturity, and intellectual ability. This connection would match the need identified for the students in the Hungerford-Kresser and Amaro-Jiménez (2012) study.

Klopfenstein (2004) asserts that participation in AP courses is an important factor for students' opportunities and performance in higher education. The involvement in college level courses while in high school not only increases student content knowledge, but also knowledge in how to navigate college environments. Rigorous academic course work prepares students to be more reflective, self-aware, and self-disciplined.

AP and college enrollment. The United States has already endorsed a college and career ready agenda with the adoption of Common Core State Standards in many states or state-specific versions of college and career ready standards (Theokas & Saaris, 2013). Students need to be well prepared to be successful beyond high school. In a large-scale study, Adelman (2006) analyzed the most recently completed national grade-cohort longitudinal data set from the National Center for Education Statistics. As part of this study, he examined the high school and college course taking patterns of students. Adelman (2006) identified through correlational analysis the strongest

predictor of success in college was the academic intensity of the courses taken in high school.

Enrollment in AP classes and participation on AP exams were also identified as significant predictors of college-going behavior in a study by Chajewski, Mattern, and Shaw (2011). When studying the 2007 cohort of high school graduates who had participated in at least one College Board program (AP, PSAT, or SAT), Chajewski et al. (2011) found 83% of the students who took at least one AP exam enrolled in a 4-year postsecondary institution. Comparatively, only 45% of the students who did not take an AP exam enrolled in a 4-year college or university. Even though it would be easy to link the increase in college enrollment to participation in an AP course, the study does not rule out other factors of student characteristics or experiences that may play into a student enrolling in college.

Having AP courses on a student's high school transcript also provides an advantage during college admission. Most colleges and universities use experience in AP courses as screening devices for admission because of the level of preparation and perseverance students acquire within these courses (Klopfenstein, 2004). Students who have taken AP courses in high school signal to colleges that they are able to engage in courses with curricular intensity.

AP and college completion. AP participation has not only been associated with a student's enrollment in college, it has also been related to college completion. Studies have consistently found that students who have advanced course experience during high school are more likely to persist to college graduation than those without the experience (Adelman, 2006; Conley et al., 2014; Klopfenstein, 2004; Santoli,

2002). Students who enroll in advanced courses increase their likelihood of earning a bachelor's degree within 4 years of high school graduation by 5% to 9% (Long et al., 2012). Conley (2007) explains that the four key components of college readiness are developed through the advanced course experiences and as students persist in challenging, rigorous coursework while in high school. They develop the resiliency and confidence needed to be successful at the collegiate level. In a comprehensive study of graduates in Florida, Long et al. (2012) identified that students who take an advanced course in high school have higher college grade point averages. In a synthesis of literature on potential benefits for students who enroll in AP courses, Santoli (2002) noted that being better prepared for the level of rigor in college courses was a potential reason college drop-out rates were lower for AP students.

Dougherty et al. (2006) also discovered that AP students do better in college than their peers who did not take AP courses. However, they offer three alternative explanations of student success. Success in college may be due to personal characteristics that led them to participate in AP classes in the first place. There is a potential that students who make the choice to enroll in AP courses would enroll and persist in college courses even if they did not take the AP course. Another possible explanation is that strong AP programs attract more academically focused students. Since not all high schools across the country offer AP courses, students who are interested in enrolling in AP courses are likely to be enrolled in high schools with more advantaged and academically focused student bodies. A third explanation from Dougherty et al. (2006) is that schools with strong AP programs may have more effectively organized practices, attracting students to enroll in AP classes.

During a study from the University of Tennessee at Martin on college persistence and performance, Duffy (2010) discovered contradictory findings from previously mentioned research on the positive relationship between completion of AP classes and persistence in college. Student participants were divided into three groups, (1) students who had earned a 3 or higher on an AP exam while in high school, (2) students whose highest AP exam score in high school was a 1 or 2, and (3) students who had not taken AP in high school. After differences in background variables such as family income, parent education, and race were accounted for in a regression model, significant differences did not exist in persistence and performance outcomes during college between students who scored a 3 or higher on an AP exam while in high school and those who did not (Duffy, 2010).

History of Inequity in Public Education

Despite the studies that have demonstrated the importance of enrolling in advanced courses in high school, not all students access the most academically rigorous classes in their schools. The College Board (2014) identified a participation gap in AP courses between middle- to higher-class White students and students from other races, ethnicities, or lower socioeconomic White students. This participation gap bolsters an already present racial and economic achievement gap in schools across our nation.

The achievement gap in our nation's schools is not new. In the early 1900s, as the social efficiency movement was growing, schools were seen as "factories in which the raw products (children) are to be shaped and fashioned into products to meet the various demands of life" (Cubberley, 1916, p. 338). A student was assigned to

academic, general, or vocational tracks based on the student's perceived skills and the employment needs within the community. Knowing that every child could not be taught all of the skills of every vocation, scientific measures of ability were needed to determine which students were best suited for which vocation (Shepard, 2000). In the 1920s, the most common scientific measure used to assign elementary students to their education track was the intelligence quotient (IQ) test (Tyack, 1974). Once on a specific educational track, the career possibilities were set in place for the student. This process was believed to segregate students by ability, allowing them to only prepare for vocations that were appropriate for their perceived skills and abilities. Decades later controversy around the use of the IQ tests were publicized based on the bias of IQ test results showing favor to White middle- and upper-class students and repressing minorities and poor students (Tyack, 1974). Students who were assigned to lower-track classes for the duration of their public education experienced curricular and instructional differences that restricted their knowledge and opportunities to learn (Darling-Hammond, 2015).

The equity of opportunities for knowledge and skill development were suggested in many federal government reports on education such as *A Nation At Risk* in 1983, Goals 2000 Report, the No Child Left Behind Act of 2001, and Every Student Succeeds Act of 2015. Each of these reports have urged states to create equitable outcomes for all students through more demanding requirements leading to a high school diploma. For instance, the No Child Left Behind Act (NCLB) forced a fundamental break from the idea that there was a relationship between race and intelligence. NCLB was adopted by the federal government to create a change in the

culture of public education by comparing student achievement on annual assessments for all students in third through eighth grades and once in high school. The performance of subgroups based on race, ethnicity, socioeconomic groups, and specialized programs were measured and compared to identify achievement gaps. Analyses of these gaps were then used to focus schools on reducing the achievement gaps that exist between the identified subgroups and middle- to high-class White students. According to *The Condition of Education* report from NCES (2016b), in 2014 the makeup of students in public schools was 50% White, 25% Hispanic, and 16% Black. The remaining 9% were Asian/Pacific Islander, American Indian/Alaska Native, or of two or more races. During this same year, of the nearly 11 million school age children, 20% were from families living in poverty; yet 38% of these children were Black, 35% were Hispanic, and 12% were White (NCES, 2016b). NCLB caused educators to look more closely at achievement and identify existing gaps for subgroups of students that included minorities, students in poverty, students receiving special education services (SPED), and students learning English as their second language (ELL).

Under NCLB, the national priority for education became to close the achievement gap and elevate the achievement of minority and low-income students. Schools were compelled through the threat of loss of funding to focus on improving the academic achievement of students who had traditionally not performed well in school (Boykin & Noguera, 2011). Even though there was a focus on closing the achievement gap, it has been difficult for Black, Hispanic, and students from poverty to catch-up with their middle or upper class White peers. Results from the 2015

National Assessment of Education Progress (NAEP) showed the achievement gaps for 8th grade Black students and their White peers were 26 points for reading and 32 points for mathematics (NAEP, n.d.). From 2005 to 2015 the gap has narrowed by only 2 points between Black students and White students. The achievement gap for 8th grade Hispanic students and White students in 2015 was somewhat better at 22 points for mathematics and 21 points for reading. For these two groups, the gap decreased by 4 points in reading and 5 points in mathematics from 2005-2015 (NAEP, n.d.).

In the same amount of time, Black and Hispanic students must learn more than White students, often with fewer resources. Chronicling his visits to schools in 30 school districts across the country, Kozol (2005) noted disparities in schools despite mandates and a national focus on equality. He points out the continuing isolation of students in the poorest sections of America's major cities. Boykin and Noguera (2011) are in agreement, "unless a deliberate effort is made to provide those who are behind with additional learning time, better instruction and more resources (especially funding), it appears highly unlikely that the gap will close" (p. 15).

Disparities in AP

Similar disparities exist between these same groups of students and their enrollment in AP courses in high school. As described in Chapter 1, students of color and students from lower socioeconomic families have traditionally been underrepresented in AP courses, even though they perform well in regular academic classes. Klopfenstein (2004) suggested reasons behind their low representation include the lack of encouragement to challenge themselves with rigorous advanced courses, such as AP classes, and their limited access to these courses. According to the College

Board (2014), only 40% of the students who could be successful in an Advanced Placement course were actually enrolled. To achieve more equitable educational opportunities and outcomes for students, high schools need to identify students who have demonstrated potential success in AP classes, encourage them to enroll, and then provide support for them to achieve successful outcomes (College Board, 2014).

Even with the documented benefits of participation in advanced courses while in high school (i.e., College Board, 2014; Conley et al., 2014; Klopfenstein, 2004; Long et al., 2012), there are large disparities in the participation levels among racial, ethnic, and socioeconomic subgroups. The fact that White students from families with min- to high-incomes enroll in college preparatory classes at higher rates than other groups has been well documented (Attewell & Domina, 2008; College Board, 2014; Klopfenstein, 2004; Long et al., 2012; Theokas & Saaris, 2013). Studying AP enrollment for 5,470 students in five high schools, Corra et al. (2011) used chi-square analyses to determine expected frequencies for enrollment in five AP courses. In each course the numbers of Black students enrolled were consistently below the expected frequencies with statistically significant residuals ($p > .001$).

In a different study of all White, Black, and Hispanic students who attended public high schools in Texas that offered at least one AP course, Klopfenstein (2004) found that Black and Hispanic students do not have equal access to AP programming. In a study size of approximately 740,000 students, the percentage of White students enrolled in AP classes was double that of Hispanic or Black students. AP enrollment for White students was 15% compared to 8% of Hispanic students and 7% of Black students. Her research also found that students from lower-income families within all

races had lower AP participation rates. In her study, Black students and Hispanic students were three times more likely to be low-income compared to White students, which caused an association to be made with race or ethnicity, rather than the intersection of race with poverty.

The College Board adopted an equity and access statement to guide schools in the implementation of their AP program:

The College Board strongly encourages educators to make equitable access a guiding principle for their AP programs by giving all willing and academically prepared students the opportunity to participate in AP. We encourage the elimination of barriers that restrict access to AP for students from ethnic, racial, and socioeconomic groups that have been traditionally underserved. Schools should make every effort to ensure that their AP classes reflect the diversity of their student population. (College Board, 2012a, p. 2)

Efforts to improve access have shown improvement in enrolling traditionally underserved students in AP classes. Between 1998 and 2002 there was an overall AP participation increase of 48%. During this same time, the AP participation increase for students from low-income families was 110% and for minority students was 77% (College Board, 2004).

Through an analysis of all students who took AP exams and the high schools they attended in 2010, Theokas and Saaris (2013) discovered that fewer than 10% of students attend a school without any AP offerings, highlighting that the majority of high schools in the country offer AP courses. This suggests that the source of the opportunity gap is students not enrolling in AP classes within the schools that have an

AP program, rather than AP courses not being offered in high schools with higher percentages of Black, Hispanic, and poor students. Theokas and Saaris (2013) argue one reason traditionally underrepresented students are not enrolling is because of barriers in place that limit access to the AP courses within high schools. Conversely, the College Board (2012b) identified that 72% of Black students and 66% of Hispanic students whose PSAT scores indicated that they had potential to be successful in an AP math class were not enrolled in an AP course. Also during 2012, the same was true for AP science courses: 69% of Black students and 65% of Hispanic students whose PSAT scores indicated their potential for success in an AP science course were not enrolled. This underrepresentation also held true for impoverished students.

As a possible explanation for the race and ethnicity participation gap, Klopfenstein (2004) states that many minority students have fewer resources in the form of academic role models at home or peers who plan to enroll in advanced courses. There also may be limited expectations for these students both in their personal lives as well as at school. All of these aspects together limit the institutional knowledge of minority students and students in poverty as they attempt to navigate the educational system and reduces the likelihood that they will see themselves as AP students. As another explanation, Corra et al. (2011) found evidence that the disproportionate enrollments in advanced classes may have more to do with social factors than academic ability. Socially, traditionally underrepresented AP student may not have the same self-expectations of being included in academically rigorous courses.

Attewell and Domina (2008) disagreed with recent research on the participation gap for race and ethnicity. After controlling for SES and prior academic performance

through a multivariate regression model, they found that Black and Hispanic students actually enrolled in more challenging courses than White students. In other words, they found that a higher percentage of minority students take more advanced courses than do White students of equal socioeconomic status (SES). However, the statistically significant disparities they found in enrollment in challenging courses were based on SES rather than race, ethnicity, or gender. Theokas and Saaris (2013) support this finding through their study identifying that students from low-income families were three times less likely to enroll in AP courses as students from middle- and high-income families. One explanation provided by Attewell and Domina (2008) is that lower expectations fall on lower socioeconomic students in general rather than specifically on all Black or all Hispanic students.

Barriers to Student Enrollment

Some of the disparities in AP participation could be associated with the barriers minority or impoverished students face in accessing these courses. Urban schools with higher minority student populations and higher percentages of students in poverty often have fewer resources and less experienced teachers when compared to suburban counterparts (Kalogrides & Loeb, 2013; Kyburg et al., 2007). Through interviews and focus groups with 132 participants across three high schools, Kyburg et al. (2007) identified access to challenging coursework and appropriate instruction as key elements to preparing for higher education. However, there were inequities in the resources among schools that created an opportunity gap for students uncovered in this study.

Having different levels of expectations for groups of students may also contribute to barriers for AP enrollment. Low academic expectations for students whose race, ethnicity, or socioeconomic status subgroups have historically underperformed in school prevent capable students from enrolling in advanced courses (Attewell & Domina, 2008; Calaff, 2008; Valenzuela, 1999). In a study by Kanno and Kangas (2014) on students with limited English proficiency and AP participation, school staff intentionally steered students away from advanced courses in order to shield them from what they perceived as too academically intense for them. Seeing students' linguistic and cultural heritages as deficits rather than assets also limits participation for many students (Valenzuela, 1999). In classrooms where teachers recognize the diversity of their students and see them as capable of learning, students performed better than in classrooms where teachers saw the class as a unit and used rigid one-size-fits-all strategies to instruction (Kyburg et al., 2007).

Further, students whose parents or older siblings did not enroll in advanced courses in high school are often unaware of the benefits AP courses could provide. Upon enrollment in high school, these students and their families lack the navigational skills to identify classes that are prerequisites in order to be prepared for the academic intensity of AP classes (Kyburg et al., 2007). Students and families also may be unaware of how to advocate for enrollment in AP courses (Kyburg et al., 2007; VanSciver, 2006). Kyburg et al. (2007) point out that by the time students reach high school, school staff assume students already have an awareness of and will self-select AP courses if they are interested. This barrier is further compounded because "parents of low-income and minority students trust school officials with the academic future of

their children” (VanSciver, 2006, p. 57). In summary, students and their families are often unaware or fail to advocate for placement in advanced classes, while school staff fail to communicate about AP opportunities, assuming students already know about them, therefore limiting access for minority and poor students.

Another barrier was identified through the results of individual interviews with 77 low-income and minority students and their parents (VanSciver, 2006). Students identified that a priority for their parents was for their children to earn good grades in school. In order to achieve this, students signed up for easier classes.

In general, these students provide information to the school officials that they should be placed in classes that typically do not require much reading and writing or higher level mathematics but make it possible for them to surrender to their parents report cards for which they receive praise. (VanSciver, 2006, p. 57)

A focus on earning good grades rather than academically challenging themselves sets them up for not being prepared for the level of work they will experience post-secondary.

Foust et al. (2009) identified three other non-academic barriers that could hinder AP enrollment for minority or low-income students: (a) negative stereotypes of AP students by non-AP students, (b) heavy workload, challenging content, stress, and fatigue of the pace, and (c) the pressure to excel. Through interviews and focus group sessions with four students and seven parents, Walker and Pearsall (2012) identified social and cultural factors that inhibit or block Latino student enrollment in AP classes. Despite previous academic success, students in the study identified possible failure in

an AP course as the primary reason to not enroll in an AP class. Following a fear of not doing well in AP classes, students cited concerns of not fitting in with other AP students. They saw AP courses as being predominately White, and were concerned with potentially being the only student of color in the class. Another cultural concern voiced by students in this study was a “self-consciousness about ‘doing better’ than your own people or having your own people wondering how can you do so well or why should you, you should go to work and help support the family” (Walker & Pearsall, 2012, p. 19). These social and cultural barriers are more difficult for schools to overcome.

The approach schools take for participation in AP courses needs to change, according to Dougherty et al. (2006). AP should not be a special set of courses for already well-prepared students, but a comprehensive program to prepare large numbers of students to complete college-level work before they leave high school. Darling-Hammond (2015) promotes addressing barriers for a high-quality education for all students:

Enormous energy is devoted in the United States to discussions of the achievement gap. Much less attention, however, is paid to the opportunity gap – the accumulated differences in access to key educational resources – expert teachers, personalized attention, high-quality curriculum opportunities, good educational materials and plentiful information resources – that support learning at home and at school. (p. 28)

Expanding AP Opportunities for all Students

In order to build a strong AP program with equitable access for all students and to encourage their participation, a culture of supportive practices needs to be in place that prepares culturally and linguistically diverse students for college (Calaff, 2008). Kyburg et al. (2007) urges educators to focus their attention on discovering pathways for greater success of students who are typically underrepresented in AP programming.

Theokas and Saaris (2013) outline five practices to open AP access for more students. The first is for schools to understand the depth of the disproportionate participation in their AP classes through examining current enrollment in AP courses. Subgroup target numbers of “missing” AP students can be identified by comparing the percentage of the race, ethnicity, or socioeconomic status of current AP students to the percentages they represent in the entire student population. The second is to analyze entry requirements for AP courses, identifying any existing “gate-keepers” preventing access for groups of students. “Take time to review existing policies and practices for AP enrollment to ensure they do not create rigid barriers simply based on tradition or for the benefit of teachers” (Theokas & Saaris, 2013, p. 9).

The third practice is to find out what students, parents, and teachers already know about access to the AP program. The missing students identified in the first practice are less likely to know about AP classes and their benefits. The fourth practice is to analyze staff expectations of which students are potential AP students, and how these expectations are communicated to students, both verbally and nonverbally. The final practice is to better prepare students earlier in their education, rather than having them catch up their last two years of high school (Theokas & Saaris,

2013). This requires intentional alignment with elementary and middle schools, so students have the skills and knowledge when they arrive to high school.

Walker and Pearsall (2012) argue “it may not be so much what we are doing as educators as what we are not doing as human beings that has the greater impact” on decreasing disproportionate AP enrollment (p. 22). A prevalent and constant conviction that minority and low-income students can succeed in AP classes is essential to creating environments where minority students can experience success and develop readiness for college (Kyburg et al., 2007; Walker & Pearsall, 2012).

Traditionally underrepresented AP students also benefit from including intentional instructional and group supports (Kyburg et al., 2007) as well as encouragement from teachers (Walker & Pearsall, 2012). The necessity of setting and supporting high expectations for all students is also needed to decrease the disparity in AP enrollment (Calaff, 2008; Lockwood & Secada, 1999). These high expectations are not just for the content being studied, but also for student work habits such as attendance, behavior, and meeting deadlines. It is also important to value students’ linguistic and cultural heritage by regarding this diversity as an asset (Calaff, 2008; Valenzuela, 1999). Examples provided were as simple as communicating about AP classes in multiple languages during a larger multicultural event celebrating the school’s diversity.

Lockwood and Secada (1999) also found teachers and counselors assisting students in visioning a positive future by creating a multi-year plan of course enrollment in high school and college to be beneficial. Calaff (2008) extended this to establishing strong relationships between students and their teachers and counselors.

These relationships must be based on authentic caring, which can be conveyed through scaffolded learning opportunities, showing students how they can improve their abilities by participating in rigorous work (Faircloth, 2009). Kyburg and colleagues' (2007) findings support this by discovering that students identified feeling acknowledged and known by their AP teacher, trusted that their AP teachers would help them succeed, and were confident their AP teachers had the expert knowledge in their field to prepare them to be successful in college.

Another strategy to expand access to AP classes is to support students by providing tutors and mentors to guide students through rigorous coursework. This was shown as an effective practice especially in schools that have an Advancement Via Individual Determination (AVID) system in place (Lockwood & Secada, 1999). Developing positive peer affiliations also supports culturally and linguistically diverse students in their preparation for college. Surrounding minority and low-income students with other students who have a high academic focus encourages high expectations for each other and provides support to manage the challenging work. Calaff (2008) also found access to technology, both as an instructional tool in class and as a student use device, is necessary to minimize barriers for students who are not able to access technology outside of school. Finally, schools should seek out opportunities to collaborate with college partnership programs, allowing students to see the benefits of attending college and to see that it is a possibility for them (Calaff, 2008; Walker & Pearsall, 2012). "Perhaps one of the most important findings from this study is the need to reach out to the community for resources that can complement school efforts in paving the road to college" (Calaff, 2008, p. 107).

In an effort to remove barriers and expand access to AP courses, an urban high school in southern California implemented and expanded on some of these strategies to change the school's academic culture (Flores & Gomez, 2011). In a five-year period, the annual number of AP exams taken increased by nearly 50%. Through the implementation of strategies below, Flores and Gomez (2011) showed students meeting or exceeding the standards on the state's 12th grade assessment grew in English Language Arts from 68% to 75% and in math from 66% to 75%.

- Recruit students who were not currently enrolled in AP courses, including reaching out to middle school students and incoming freshmen.
- Redesign the AP Coordinator's role to become the AP Advocate, focusing on getting AP program information out to all stakeholders. Students and parents were regularly informed of the benefits of enrolling in an AP course through the school website, in daily announcements, and during any parent meetings/events that were held.
- Realign curricular offerings to create rigorous prerequisites, preparing students for future AP classes.
- Create a school-wide focus on improving writing to develop the skills needed to be successful in an AP course.
- Require all teachers teach both higher- and lower-level classes in order to identify and recruit potential AP students.
- Provide AP teachers with quality training that included scaffolding techniques.

- Develop a professional learning community for AP teachers to provide support and to share strategies.
- Implement a “no drop” AP policy and require all students to take the AP exams.
- Encourage students to participate in after-school or Saturday tutoring sessions for AP students who needed extra support.
- Establish and evaluate annual goals for the AP program to identify strengths and areas that needed improvement.
- Collect student input to refine the AP program to better meet student needs, when possible.

These strategies were effective in shrinking the participation gap; however, the percentage of students passing at least one AP exam with a score of 3 or higher decreased during this same five year period of time from 49% to 31% (Flores & Gomez, 2011).

Low AP exam scores. Even though the number of low-income and minority students taking AP courses is on the rise, the percentage of these students who score a 3 or higher on AP exams remains low (Dougherty et al., 2005). For students who graduated in 2013, 72% of the AP exams taken by Black students were assigned a score less than 3, and 59% of exams taken by Hispanic students were scored less than a 3. Comparatively, only 36% of White students scored below a 3 (College Board, 2014). These results demonstrate that equal access for underrepresented students is not enough. Additional measures are needed in schools to create equitable educational environments as well.

Kyburg et al. (2007) agree that equity in access is not enough for minority and low-income students. Teachers whose students who are new to these types of courses reported students are entering less well prepared for the rigor of advanced study. They needed to modify their instructional supports to make the learning accessible and relevant to all. This included built-in study or support groups that not only helped students with the content of the course, but also provided students with opportunities to practice discussing topics using formal academic language. AP classroom environments that are flexible and attuned to the individual needs of culturally, linguistically, and economically diverse students are ones in which learners can experience success (Kyburg et al., 2007).

Criticisms of AP Expansion

Attewell and Domina (2008) caution school districts to be aware of the potential of advanced courses becoming watered down. “As more students attempt higher-level courses over time, the payoff to what had previously been advanced courses may disappear while benefits shift to even more advanced courses taken by the most elite of students” (p. 52). They argue that it is not the curricular intensity of the courses that results in higher test scores, increased graduation, and a higher percentage of students attending a four-year university, but the fact that only a small elite number of students can enroll in the course. As an example, Adelman (2006) shows that in 1982, Algebra 2 was highly associated with earning a college degree, but by 1992 the association had significantly weakened. In 1982 almost 25% of students took Algebra 2 and 46% of these students earned a bachelor’s degree. By 1992, Algebra 2 enrollment increased to 30%, but the percentage of these students who earned a

bachelor's degree was down to 39%. The positive association seen between advanced course enrollment and the odds of graduating from college had declined as enrollment in the advanced course increased.

Klopfenstein (2003) is concerned about the rapid increase in AP enrollment because “the accelerated pace and rigorous college-level curriculum of AP classes are not appropriate for all students” (p. 42). If students are admitted to AP courses that are not prepared for the curricular intensity, teachers must adjust to lower performing students. In a survey of 1,000 AP teachers, 56% agreed that many of their students overestimated their abilities and were in over their heads (Farkas & Duffett, 2009). Teachers believed that many students are not ready for the pace, expectations, and content of their AP courses. Teachers must choose to slow down the pace or leave students behind in the instruction.

Contradicting these concerns, Malkus (2015) compared 12th grade math performance on the National Assessment of Educational Progress (NAEP) for 2000, 2005, and 2009 for graduates who had earned AP credit and graduates without AP credit to determine if AP courses have become less rigorous in the last decade. The data showed that AP course takers had comparable NAEP scores across the decade, even with a 35% increase in the number of students taking AP during this same time (Malkus, 2015). These data suggest that even as AP grows, the strength of the rigor in AP courses has remained.

Another concern is the need for more AP teachers as the number of courses continues to increase (Klopfenstein, 2003). If AP classes do not have teachers who have had AP training or are teaching out of their area of concentration, then students

are receiving a misrepresentation of the degree of difficulty of college-level work.

Once in college they may find themselves unprepared for the level of rigor and demand (Klopfenstein, 2003).

Schneider (2009) claims there has been a decline in the status of AP during its rapid expansion and elite, high-status high schools are rethinking their association with AP. Initially, AP gained its reputation for challenging the top students from the nation's top schools. Schneider warns that if these schools move away from AP and find a new way to distinguish themselves, they may undermine AP's credibility. He further questions: "if it is not good enough for them, will colleges and universities still reward students with AP on their transcripts" (p. 828).

Academic Identity

One aspect of building in success for traditionally underrepresented students enrolled in AP courses for the first time is a need for them to view themselves as academic individuals who can be successful with rigorous coursework. Engaging learning experiences allow students to connect the content being learned with their own identity development (Faircloth, 2009). On the other hand, learning experiences that do not engage students do not help them form their identity in the learning environment. This identity development is associated with a sense of belonging, both socially and academically. Osborne and Jones (2011) developed a model connecting background factors such as group membership, community environment, school climate, and past educational experiences to a student's development of their identity (see Figure 1). Based on how they see themselves as students, academic behaviors and

actions lead to academic outcomes for the student. These then cycle back and re-inform students' identity, causing them to re-evaluate future academic behaviors.

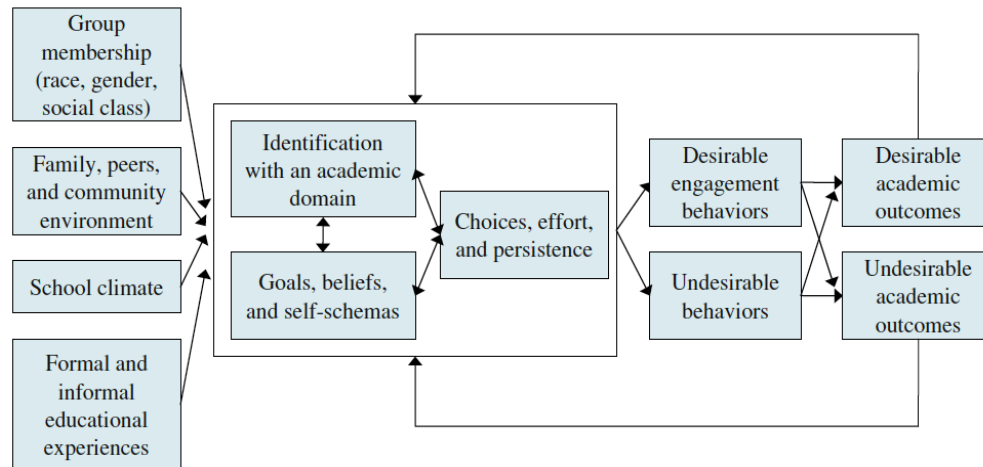


Figure 1. Precursors and consequences of identification with an academic domain from Osborne & Jones (2011).

One association of academic belonging is the student's relationship with the teacher and how that relationship serves as a connection to school (Faircloth, 2009). A teacher's ability to help students create a connection to school can be demonstrated by listening to and nurturing the student's ideas. Faircloth (2009) surveyed 83 9th grade students on belonging and classroom connections with identity. The study revealed a student's connection and engagement at school is impacted by the need to affirm their sense of self. This need to express their self is demonstrated through stories, values, perspectives, interests, and priorities. The gap between the experiences students have outside of school and those they have in school may be a primary reason for a student's lack of engagement (Fairbanks & Ariail, 2006). This affirmation through the teacher and student relationship creates a sense of belonging for the student at school.

To learn in any community, the learner must become a member and negotiate his or her own identity within the existing community (Wenger, 1998). Applying this to a classroom setting, this formation of the student's identity is a continual process of shaping and reshaping who they are expected to be and who they want to be within a learning context. Faircloth (2012) refers to this as a student's identity-in-practice. As the student receives, resists, or revisits expectations from others, he or she is practicing their identity. Faircloth (2012) asserts, "a student's negotiation of their identity-in-practice within the context of school is powerfully positioned to either constrain or nurture their engagement in learning" (p. 187). Supporting this, AP students responded during interviews that they developed a strong bond with their classmates, noting that the friendships were nurtured through shared experiences (Foust et al., 2009). Since all students have the same expectations and the same pressures, they can support each other through the challenging times. On the other hand, Foust et al. (2009) found that for students who were new to AP, it was difficult to break into the close community at first, because many of the AP students had been taking classes together for a while. It was not clear in the Faircloth (2012) or Foust et al. (2009) studies if the negotiation process for identity formation was different for students who were not similar to the rest of the class. Specifically, there is a gap in understanding if traditionally underrepresented AP students differ in this process than commonly represented AP students.

Faircloth (2012) found there is an overlap between a student's interest and identity by studying the engagement levels for 34 students in their English class when they were allowed to design their classwork in a way to connect it to an issue or topic

that was meaningful to them. Students reported that relating their learning to who they were becoming in the learning setting increased their engagement. This demonstrates that adolescents are motivated and intrigued through the process of their identity negotiation, which allows this process to be an incentive for student engagement (Faircloth, 2012).

Studying the academic identity formation and motivation among ethnic minority students, Mathews et al. (2014) found that academic identity is formed from both internal and external perceptions and can predict motivation towards academics. The internal perception focuses on the value the student attributes to the particular aspect of his or her self-concept, such as the student's perceived enjoyment or interest in participating in an academic task (Mathews et al., 2014). This intrinsic value reinforces the student's self-understanding and scaffolds the student's academic identity. As academic responsibility and rigor increase, the intrinsic value declines, typically during adolescence. According to Griffin (2002), in comparing Black and Hispanic student with White students, academic performance plays a less important role in shaping their academic behaviors and decisions.

The external perception for the development of a student's academic identity is strong during adolescence and focuses on belonging and social connectedness (Faircloth, 2009; Mathews et al., 2014). By high school, the feeling of school belonging tends to decline due to the size of the school and the focus of instruction shifting to the content rather than the student. However, students who struggle to achieve can still become self-regulated and motivated in academic contexts if they perceive themselves as integrated and appreciated members within the academic

community (Mathews et al., 2014). Examples in a school setting include strong teacher-student relationships, encouragement to try extracurricular activities, and positive peer support.

Brown, Kanny and Johnson (2014) reinforced these findings by identifying that the school setting shapes how high-risk, African American youth see themselves as students and how it helps them plan for their future academic opportunities. In a self-reported survey, students identified teacher-student relationships as a strong factor that contributed to the school setting being a change agent in how they perceived their academic identity, supporting the findings from Foust et al. (2009). Another factor identified was a safe learning environment created through enforcing high standards of behavior for all students. The third aspect identified by students that helped them shape their academic futures was a challenging and engaging learning environment.

Research from Nussbaum and Dweck (2008) supports earlier research pertaining to the way students view themselves intellectually, their academic identity, and the effect this view has on their participation in rigorous coursework. This study examined whether a person responded in a defensive manner or pursued remedial support when presented with negative academic feedback to identify if patterns were present in the participants' beliefs about intelligence. Defensiveness is used to protect one's self-esteem and is often exhibited as ignoring negative feedback or comparing oneself to someone who is worse off (Nussbaum & Dweck, 2008). Consistent in all three experimental studies within this research, they found that how a student responded was tied to whether their belief about their intelligence was fixed or malleable. If the participant saw his abilities and intellectual capabilities as fixed, a

defensive response occurred by comparing himself to others who did worse to make himself feel better or he disregarded the feedback completely. If the participant viewed his or her abilities as malleable and capable of continual development, the response was to actively seek remediation (Nussbaum & Dweck, 2008). The researcher found no studies connecting student beliefs about the malleability of their intelligence and their performance in AP courses.

Summary

A review of the literature and pertinent research studies suggest an important predictor of students' post-secondary school achievement is their enrollment in and completion of rigorous academic coursework during their years in high school (Adelman, 2006; Boykin & Noguera, 2011; Dougherty et al., 2006; Long et al., 2012; Rodriguez et al., 2013; Theokas & Saaris, 2013). Research exists demonstrating the importance of a rigorous high school preparatory program to college success (Kyburg et al., 2007; McKillip & Rawls, 2013; Theokas & Saaris, 2013; Walker & Pearsall, 2012), on the importance of attending and persisting in college (Adelman, 2006; Attewell & Domina, 2008; Conley et al., 2014) and on the disparities in rigorous academic opportunities in high school (Calaff, 2008; College Board, 2014; Long et al., 2012; Flores & Gomez, 2011; Kanno & Kangas, 2014; Lockwood & Secada, 1999). AP programs are widely accepted as a measure of secondary rigor (Malkus, 2015; Sadler, Sonnert, Tai & Klopfenstein, 2010; Schneider, 2009), but there are inequities in participation for minority students and students of poverty (College Board, 2014).

Just as in public education as a whole, barriers exist to access AP courses for minority and low-income students (Foust et al., 2009; Kanno & Kangas, 2014; Kyburg

et al., 2007; VanSciver, 2006; Walker & Pearsall, 2012). Previous research provides strategies to overcome these barriers and expand access for minority and impoverished students to AP courses (Calaff, 2008; Flores & Gomez, 2011; Kyburg et al., 2007; Lockwood & Secada, 1999; Theokas & Saaris, 2013; Walker & Pearsall, 2012). However, gaps in the literature exist with regard to identifying supports and challenges from the perspective of first-year and traditionally underrepresented AP students in a suburban high school.

A review of the literature was also completed on the development of a student's academic identity (Brown et al., 2014; Faircloth, 2009; Faircloth, 2012; Mathews et al., 2014; Nussbaum & Dweck, 2008; Osborne & Jones, 2011). The process that occurs for a student to determine his identity and fit within a community of learners through interactions with others and his own self-perception frames how he views himself as an academic individual (Faircloth, 2012; Mathews et al., 2014; Wenger, 1998). Further research is needed on how first-year participation in AP courses affect the academic identity of Black, Hispanic, and low-income students.

Chapter 3: Methodology

The following chapter discusses the methodology used to conduct this mixed-methods research study on first-year and traditionally underrepresented students in Advanced Placement courses. It reviews the identified research questions as well as provides a description of and rationale for utilizing the selected research methodology for this study; designates the procedures and provides an explanation of the sampling techniques that were utilized; and highlights the data collection and describes the procedures of the data analysis.

Research Questions

The purpose of this mixed-methods study was to explore the perceptions of first-year AP students and traditionally underrepresented students enrolled in an AP course for the first time. The specific perceptions investigated included: (a) the supports and barriers associated with participating in the AP course, and (b) how their academic identity was affected by participating in the AP course.

The overarching questions for this study are:

1. How does student performance in Advanced Placement courses differ for traditionally underrepresented AP students compared to commonly represented AP students?
2. For students who are enrolled in Advanced Placement courses for the first time, what elements do they believe caused them to successfully complete the course or interfered with their success?
3. Are these elements different for first-year traditionally underrepresented and commonly represented AP subgroups?

4. What changes occur in how students see themselves as academic individuals during their first year in an Advanced Placement course?
5. After completing their first year of an Advanced Placement course, what percentage of students plan to enroll in another Advanced Placement course?

Rationale for Methodology

These research questions were addressed through mixed-methods research. This type of research combines quantitative and qualitative approaches to build on the strength from each in order to “understand a phenomenon more fully than is possible using either quantitative or qualitative approaches alone” (Mills & Gay, 2016, p. 8). Ary, Jacobs, and Sorensen (2010) also argue that mixed-methods research provides a more complete explanation of the research problem than either method could provide on its own. In order to fully understand the student perceptions of supports and barriers in their AP classes and changes in their academic identity while enrolled in an AP class, data from both quantitative and qualitative methods are necessary, allowing for explanation or clarification of initial findings, as well as an opportunity to further develop interpretations.

This mixed-methods research was an explanatory sequential design, happening in two phases. The first phase of the study consisted of quantitative data collection and analysis. Survey research was conducted through using a pre- and post-survey to measure change over time. The design of using the same items on the pre- and post-survey provide for instrumentation validity. Achievement data such as marks in AP classes and AP exam scores were also analyzed. Findings from the quantitative phase were used to inform the data collection in the second phase, which consisted of student

interviews. This second phase included data collection, analysis, and interpretation of qualitative data. One of the strengths of the explanatory sequential design is that the researcher can use the qualitative findings to elaborate on or explain the quantitative findings (Mills & Gay, 2016). The flowchart in Figure 2 showing this study's design is adapted from Creswell (2013).

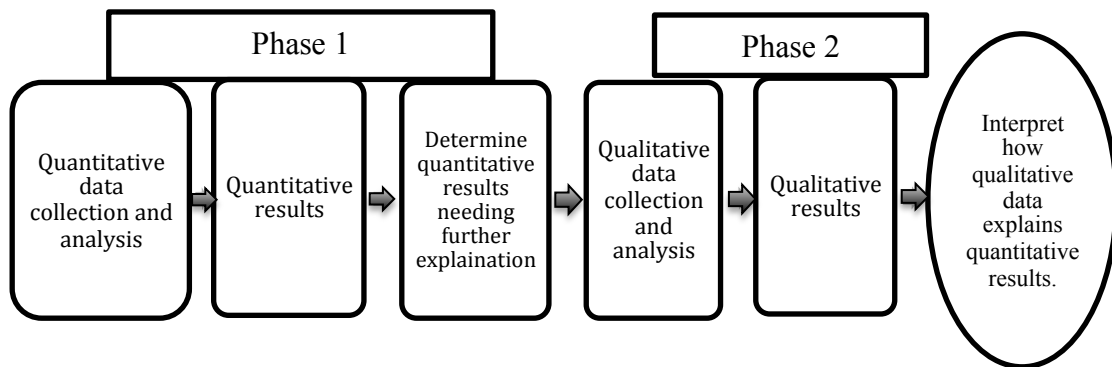


Figure 2. Flowchart depicting an explanatory sequential design mixed-methods research model. Adapted from *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research*, by Creswell, 2013.

Context

This study was set in a suburban high school in the northwestern United States, with an enrollment of 1,656 students in grades 9th – 12th. The student body was predominately White at 72%, with 18% Hispanic students and 2% Black students. The number of students who come from lower socioeconomic (SES) families had increased in this school over the last decade to 34%. Even with the changing student demographics, Table 3 shows that there is less diversity in this high school than other schools across the district. Also during the study, of the 70 staff members at the school, 92% identified as White, 3% as Hispanic, and 0% were Black.

Table 3

2015-2016 Student Demographics (9th-12th Grades)

	School AP (<i>n</i> =391)	School Overall (<i>n</i> =1,656)	District Overall (<i>n</i> =3,918)
Economically Disadvantaged	26%	34%	43%
Hispanic	15%	18%	23%
Black	<1%	2%	4%
White	75%	72%	64%

Note. Students in the economically disadvantaged subgroup are identified through federal guidelines for the free or reduced lunch program.

Table 4 provides a comparison of student performance and graduation rates for the school and district. When compared to other high schools in the metropolitan area where the school resides, graduation rates were among the highest at 84%. Students who met or exceeded on the 11th grade Smarter Balanced Assessment for English Language Arts in 2015 was 80% and Mathematics was 35%. Both of these results lead other schools in the metropolitan area. White students outperformed Hispanic students and Black students in all areas for both the school and the district. Students in the high school that come from low-income families performed better than their peers across the district in English Language Arts and had a higher graduation rate.

Table 4

Participating School and District Student Performance

	ELA		Math		4-Year Graduation Rate	
	School	District	School	District	School	District
All	80%	75%	35%	31%	84%	74%
Hispanic	74%	63%	23%	19%	81%	69%
Black	67%	61%	33%	11%	38%	56%
White	82%	80%	35%	34%	87%	76%
Economic Disadvantage	73%	65%	21%	21%	78%	69%
SWD	18%	23%	7%	9%	58%	51%

Note. Students in the economically disadvantaged subgroup are identified through federal guidelines for the free or reduced lunch program. ELA and Math percentages are meeting or exceeding on Smarter Balanced Assessment.

AP programming. Enrollment in the AP program at the participating school grew from 253 students during the 2013-2014 school year to 391 students in 2015-2016. The majority of these 391 students identified as White and just over a quarter came from economically disadvantaged families. In comparison, Table 3 shows that over a third of the students from the school were from low-income families, whereas 43% of high school students in the district were economically disadvantaged. Percentages for Hispanic students and Black students were also lower in the AP program compared to the school and district populations.

Even though students can enroll in AP courses during any of the four years in high school, five of the courses were available to only students at certain grade levels. The only course available to 9th graders was AP Human Geography. AP United States History was only offered to 10th grade students. AP Calculus, AP English Literature

and Composition, and AP European History were only available to 12th grade students. The other five AP courses shown in Table 5 were accessible to students in 10th, 11th, and 12th grades. However, the majority of AP courses were taken during the last two years of high school. Some students at the high school take more than one AP course at a time, which resulted in 1,116 courses completed in the 2015-2016 school year.

Table 5

Advanced Placement Course Enrollment in 2015-2016

Content Area	Advanced Placement Course	Course Enrollment				
		9 th	10 th	11 th	12 th	Total
Science	Biology	0	2	113	8	123
	Chemistry	0	0	27	38	65
Mathematics	Calculus AB	0	0	4	43	47
	Calculus BC	0	0	0	14	14
English	English Language and Composition	0	0	229	0	229
	English Literature and Composition	0	0	0	74	74
History	European History	0	0	0	128	128
	United States History	0	165	0	0	165
Social Science	Human Geography	84	0	6	95	185
	Macroeconomics	0	0	86	0	86

Recruitment of AP students. In an effort to align the enrollment in the AP program with the student population of the school, an initiative was put into action to identify and recruit students who had been successful in other classes, but were not choosing to enroll in AP classes. Teachers were asked to nominate students who had performed well in their classes and statewide assessments were analyzed, looking for students who performed in the top 25%. Combining these two lists with student responses on a survey, an outreach list was created showing students who had not

enrolled in AP previously but were demonstrating the necessary traits to be successful in an AP course. These students attended an informational assembly explaining the AP program and its benefits as well as participated in one-on-one conversations with school staff. Their parents were invited to an AP Parent Information Night to expand their knowledge of how the AP program can benefit their children. Because of these recruitment efforts and other students who already planned to newly enroll in an AP class, there were 156 first-time AP students during the 2015-2016 school year.

Participants

The study included 270 AP students from the high school during the 2015-2016 school year that were in 11th or 12th grade. Of these students, 114 were male and 156 were female. There were 114 students who had previously been enrolled in AP classes and 156 students who were new to an AP class. As shown in Table 6, 114 of the first-time students were in the 11th grade and 42 were in 12th grade. Of these first-time AP students, 29 of them were from traditionally underrepresented race or ethnicity subgroups in AP programs, with the majority being Hispanic. Students who came from low-income households were also traditionally underrepresented in AP courses: 43 of the first-year participants fell into this category. This study did not disaggregate results for the different AP classes study participants were enrolled. Rather the study analyzed student performance encompassing all of the AP classes as a whole.

Table 6
Number of Participants by Race/Ethnicity

Race/Ethnicity	First-Year AP Students (<i>n</i> = 156)		Previously Enrolled in AP (<i>n</i> = 114)	
	11 th Grade	12 th Grade	11 th Grade	12 th Grade
Asian	5	1	3	2
Hispanic	20	10	4	7
Two or More Races	9	3	5	4
White	80	28	37	52
Total	114	42	49	65

Design and Procedure

The explanatory sequential design of this study included multiple methods to collect data. In the first quantitative phase, achievement and survey data were used to provide a general picture of the research problem. The second qualitative phase included interviews of selected students to refine, extend, or explain the general picture (Creswell, 2012).

Phase one. At the beginning of phase one, November 2014, all students enrolled in the school completed a survey to measure their growth mindset, grit, academic self, and academic strategies. Approximately 18 months later, June 2016, students who were enrolled in AP were asked to complete a post-survey in order to measure changes in perceptions of their learning mindset. The post-survey also allowed students to identify supports in place and barriers they came across throughout the AP course. In this phase student marks and AP exam scores were collected for all 11th and 12th grade students who were enrolled in an AP course during the 2015-2016 school year.

Phase two. In this study, the results from phase one informed the researcher of the details for next steps needed in the second phase, which was qualitative. Potential students were identified and invited to be interviewed in order to learn more about the experience of traditionally underrepresented students during their first year in an AP class. There were 16 students who met the criteria of being part of the traditionally underrepresented subgroup, had recently completed their first year in an AP class, and were still enrolled at the school. Five of these students participated in semi-structured interviews during October 2016.

Even though the number of participants was smaller than in phase one, the interviews explained responses from the survey in more detail, helping the researcher better understand patterns and trends (Mills & Gay, 2016). Prior to the interviews, parent consent forms for minors and student assent forms were given to students who matched the criteria to be interviewed. The interviews happened at the school during a time that was least disruptive to each student's current classes. The interview data was coded and analyzed to present a more in-depth student perspective than what was presented in phase one.

Instruments

Along with the student achievement data collected, the use of surveys and interviews provided the researcher an opportunity to triangulate findings to strengthen the results of the study.

Survey. The initial survey given to all students in the high school during November 2014 was created and administered by Equal Opportunity Schools (EOS) in partnership with the school district. The survey consisted of 94 questions, but

depending on their answers all students did not receive all of the questions. For instance, if they answered that they were enrolled in an AP class, they were not asked if they had ever heard of AP courses in the school. There was a mix of structured and unstructured items in checklist, Likert-type, and free response formats. The survey's purpose was to identify student learning assets, their existing knowledge of AP classes, and their goals and aspirations for future education and careers. The student learning assets associated with this survey, shown in Table 7, are research based (J. Paulson, personal communication, July 19, 2016).

This survey was widely used during the EOS Equity & Excellence Project from 2013 to 2016. According to the EOS website, eoschools.org/equityexcellence, there were 210 schools across 15 states involved in the project to increase access to college level rigor for low income students and students of color (EOS, n.d.).

In order to measure changes in students from the pre-survey, the post-survey included structured and unstructured items from the pre-survey. The focus of the post-survey was to learn how it felt to be in an AP class compared to classes that were not AP, supports and challenges students experienced in AP, and current perceptions of students' learning assets. The school administered the post survey for AP students in June 2015. Students self-reported through Likert-type scale questions.

Table 7
Learning Asset Descriptions

Learning Asset	Description
Growth Mindset	The belief that the most basic abilities – including intelligence – grow with dedication and hard work. Brains and talent are just the starting point. This view nurtures a love of learning and a resilience essential for great accomplishment.
Grit	The ability to sustain interest in and persistence toward long-term goals. Grit fuels a student’s ability to overcome obstacles, embrace challenges and stay the course.
Academic Identity: Academic Self Academic Strategies	The student perception of their <i>academic self</i> in the future as well as their confidence in the <i>academic strategies</i> they have to get them there. If a student has both the <i>academic self</i> and <i>academic strategies</i> , then the learning asset <i>academic identity</i> is present.

Note. Personal communication from Paulson, Equal Opportunity Schools on July 19, 2016.

Students identified their level of agreement on survey items, providing an understanding of their perceptions of helpful supports that were in place and barriers they faced. Some examples items include:

- I feel like a part of a community in my AP class.
- My AP teachers believe that I am capable of succeeding in class.
- I am comfortable asking for help from other AP students when I need it.

Samples of the growth mindset items include:

- I have a certain amount of intelligence and I can’t do very much to change it.
- It’s possible not just to learn more, but to get smarter as well.
- I can learn new things, but I can’t really change how smart I am.

Samples of grit items include:

- I am a hard worker.

- I am discouraged by hardships.
- I finish whatever I begin.

Some examples for academic self include:

- Doing well in school.
- Getting good grades
- Understand the material in my classes.

Having the academic strategies asset was determined from agreement on items like:

- Successfully handling problems that come my way.
- Working hard to achieve my goals.
- Coping well with distractions.

Students also indicated if they were planning on taking another AP course in the future and asked to explain their response. The full post-survey was 65 questions with 45 Likert-type scale items, 13 multiple-choice items, 4 free-response items, and 3 checkbox items. The full survey can be found in the Appendix A.

Interviews. In the second phase of the study, interviews were conducted with a subset of the participants from the first phase of the study. The interviews were semi-structured, with most of the questions predetermined. This design allowed the researcher to follow up on a given response (Wilkinson & Birmingham, 2003). Prior to the start of the interview, the researcher emphasized the need for honest and open answers to prevent social desirability bias by the participants (Ary et al., 2010). For instance, student may have been uncomfortable stating that there were barriers for their learning based on teacher actions. The researcher strongly emphasized to students that their comments were confidential and would not be traceable to them. It was important

for them to understand that neither they nor their AP teachers could have any adverse actions taken against them from comments they made. According to Ary et al. (2010), interviewer bias occurs when the interviewer's own feelings and attitudes influence the way questions are asked or interpreted. It was important to prevent this, especially since the findings from the quantitative phase of the study were known to the researcher prior to the interviews. To prevent this type of bias, the researcher kept a reflective journal throughout the interviews and while analyzing the responses.

The 11 interview questions were peer reviewed by 12 doctoral students to strengthen the reliability of questions (Creswell, 2012) and as validation to the interview process (Creswell, 2013). Critiquing interview questions for ambiguity or needed clarity made the interview items stronger measures for the study. The researcher conducted two practice interviews with students not in the study to investigate how high school students would respond to the questions. This helped to identify needed changes in the flow of the questions, and to determine if the interview questions needed to be revised. The final interview questions were:

1. What led you to choose to take an AP class last year?
2. What were your experiences like in this AP class?
3. How would you rate your academic skills (e.g. reading, writing, thinking levels, note taking, organization...) before you took an AP course? Why?
4. How would you rate your academic skills after you took an AP course? Why?
5. What lessons, activities or instructional strategies used by your teacher helped you learn the most in this course?
6. What were some of the challenges you felt you needed to overcome during your AP class?

7. Were these challenges still there at the end of the school year?
8. If you struggled with a concept in your AP class, where did you go for help?
9. What academic or personal skills did you develop through taking an AP course?
10. Did you enroll in an AP class this school year? Why or why not?
11. Is there anything else you would like to share about your experience in your AP course?

Each interview lasted no longer than 20 minutes and occurred at the high school during the school day. During the interviews, participant responses were recorded and later transcribed. Written field notes were taken during the interview and reflective notes were logged at the conclusion of each interview, noting the setting, time of interview, length of interview, and any observations needing to be noted by the researcher (Creswell, 2012).

Ethical Considerations

The researcher received permission from the school district involved in this study. The pre- and post-survey data, AP exam scores, and AP class marks were already part of data in the district. These data were stored on a password protected district computer, backed up on a district server, and stored under password in Dropbox. Consent permission from the parents of the selected students who were minors was collected for those who were interviewed. Also, all of the interviewed students were asked to provide written assent to their participation. The names were coded to protect student identities. When reporting the research findings, student survey responses, interview responses, and achievement data were confidential and unrecognizable to an individual student. The links between the data responses and the

participants were nonexistent (Creswell, 2012). Permission was granted from the University of Portland's Institutional Review Board (IRB) to conduct this research study.

Role of Researcher

The researcher has 31 years of experience working in public education. The past 14 years were spent as an administrator in the district represented in this study. During the time of this study, the role of the researcher was Deputy Superintendent of Teaching and Learning for the school district in this study. Most of the years in public education have been in middle schools that served a majority of students who came from families who had mid- to high-socioeconomic status and were predominately White. In these schools, students who came from lower-income families were missing from the advanced classes.

Data Analysis

The data collected were analyzed in a manner that permitted the researcher to answer the research questions (Creswell, 2012). In this research, data were gathered through multiple sources, allowing for triangulation, increasing the reliability and validity of the research. All quantitative data were analyzed using SPSS and Excel. Research findings from each phase of the study were reported, as well as how the qualitative interview findings support the findings from the achievement data and survey responses from the quantitative phase.

Achievement data. Two types of student achievement data were collected and analyzed for participants in this study: (a) the marks students earned in their AP classes and (b) the scores students earned on the AP exams. The mark the student earned and

the AP exam score are achievement measures reflecting a student's current proficiency in a given area of knowledge (Mills & Gay, 2016). Descriptive statistics that indicate general tendencies in the data (Creswell, 2012), including percentages, means and standard deviations, were calculated with the marks and AP exam scores.

Once these analyses were complete, inferential statistics that assess "the differences of a group or the relationship among variables" were conducted to make predictions about the population (Creswell, 2012, p. 182). A comparison of traditionally underrepresented students and commonly represented AP students were analyzed through independent samples *t*-tests to identify similarities and differences between the two groups for the marks earned in the AP courses and the scores from the AP exams. In order to determine if there is a relationship between the grades students earned in their AP class and their performance on the corresponding AP exam, a Pearson product moment correlation coefficient (Pearson *r*) was conducted. This test showed the direction as well as the magnitude of the relationship (Ary et al., 2010). Statistical significance was evaluated on each of these tests with criteria of $p < .05$.

Survey data. The survey data analyzed in this study were affective in nature, measuring characteristics such as interests and attitudes (Mills & Gay, 2016). These data were self-reported by the participants responding to a series of questions or statements. Responses were analyzed to determine changes in learning mindset characteristics, as well as identify student perceptions of the supports received and the barriers faced in their AP course. A comparative analysis using an independent samples *t*-test was conducted to see if differences existed among first-year AP students and students who had been in AP classes longer than one year. Responses from

traditionally underrepresented AP students and commonly represented AP students, all from the first-year subgroup, were also compared to identify differences in their perceptions.

Both the pre- and post-survey responses were used in analyzing changes that occurred in how students perceived their learning assets (growth mindset, grit, academic self, and academic strategies) during their first year in an AP course. Descriptive statistics were used to provide a general overview and paired sample *t*-tests were conducted to investigate the statistical significance of the changes.

Interview data. In addition to student perceptions gathered from the survey data, selected participants provided responses during interviews. According to Mills and Gay (2016), data collection and analysis continually interact in this process. “Although ongoing analysis and reflection is a natural part of the qualitative research process, it is important to avoid premature actions based on early analysis and interpretation of data” (p. 564). Each recorded interview was transcribed shortly after its completion. The transcription process helped the researcher become familiar with the data and identify emerging themes.

Provisional coding was used to organize the interview data for this study. This allowed for the codes to emerge from the research and also permitted them to be modified throughout the data analysis stage (Miles, Huberman, & Saldaña, 2014). Once the data were coded, the researcher created a concept map to organize the relationships between the major and minor themes identified in the coding process. The concept map assisted the researcher in the interpretation of the interview data. “The researcher’s task is to determine how to identify what is important, why it is

important, and what it indicates about the participants and context studied” (Mills & Gay, 2016, p. 574).

Phase two analysis supports phase one. The final step in an explanatory sequential design was to connect the interpretations from the qualitative phase back to the initial quantitative phase of the research. The data analysis from both phases together provided more in-depth answers to the research questions for this study.

Summary

The purpose of this mixed-methods study was to identify student perceptions of supports and barriers in Advanced Placement (AP) courses as well as how their academic identity was affected for students who were enrolled in their first AP course, specifically students who were identified as traditionally underrepresented AP students at a suburban high school in the northwestern part of the United States. There were 270 participants in the study who were 11th and 12th grade students.

In order to study the perceptions of these first-year AP students, an explanatory sequential design occurred in two phases. During the first quantitative phase the researcher analyzed the marks students earned in their AP classes and the scores they earned on their AP exams. Statistical significance was examined between first-year AP students and students who had been previously enrolled in AP. Within the first-year student group, statistical significance was also examined between traditionally underrepresented and commonly represented students in AP. Also during this phase, survey data were examined to identify student perceptions of supports and barriers for them in their AP classes. At the end of the first phase, changes in their learning mindset assets were analyzed from their responses on pre- and post-surveys.

The second phase of the research design was qualitative and included interviews of selected students from the original participant group. The interviews allowed the researcher to gain clarification on the findings from the first phase of the study. The data analysis and interpretation of the interview responses connected to the findings from the first phase. Together, the two phases in this design provide a more complete study of the research questions.

Chapter 4: Data & Analysis

The purpose of this study was to examine first-time student performance in Advanced Placement (AP) courses, the supports these students receive, the barriers they experience, and explore whether their participation in an AP class for the first time affected how they saw themselves as academic individuals. In the previous chapter, the methodology of the research was discussed, including the design, setting, instruments used, as well as the data collection and analysis procedures. Reporting of the analysis is organized to address the five research questions in this study:

1. How does student performance in Advanced Placement courses differ for traditionally underrepresented AP students compared to commonly represented AP students?
2. For students who are enrolled in Advanced Placement courses for the first time, what elements do they believe caused them to successfully complete the course or interfered with their success?
3. Are these elements different for first-year traditionally underrepresented and commonly represented AP subgroups?
4. What changes occur in how students see themselves as academic individuals during their first year in an Advanced Placement course?
5. After completing their first year of an Advanced Placement course, what percentage of students plan to enroll in another Advanced Placement course?

Research Question #1: Student Marks and Exam Scores in AP Courses

To answer the first research question an analysis of the marks students earned in their AP courses and the scores they earned on the AP exam that corresponds to the

course was conducted. The analysis included 270 students who were in the 11th and 12th grades and were enrolled in at least one AP course during the 2015-2016 school year. Both the class marks and the AP exam scores use a five-point scale to measure student progress. For the marks, students can earn an A, B, C, D, or F. For comparison purposes these grades were converted to numbers, with an A = 4, B = 3, C = 2, D = 1, and F = 0. In order to determine a final mark for AP courses that last a full year, the mean of both semesters' marks was calculated. If a student took more than one AP course during the year, the mean for all semesters' marks from an AP course was determined. On each AP exam, students can earn a score of 1 through 5. Students who score a 5 are deemed as *extremely well qualified* to move onto the next level of college course, scoring a 4 shows that they are *well qualified*, scoring a 3 demonstrates they are *qualified*, a score of a 2 represents *possibly qualified*, and scoring a 1 means there is *no recommendation* on the student's readiness for the next college level course.

For all 11th and 12th grade AP students, the mean for marks in AP classes was 2.90, which is nearly a B. The mean for the AP exam score was 2.10, which is slightly better than *possibly qualified* (see Table 8). The mean for marks in AP class for students who had taken an AP course previously in high school was 0.61 higher than students enrolled in an AP class for the first time. An independent sample *t*-test was conducted and determined there was a statistically significant difference, $t(269) = -5.35, p < .001$, in marks between first-year AP students and students who have been in an AP course before. When comparing AP exam scores for students who were enrolled in an AP class for the first time and those who had previously taken an AP course, the difference was also statistically significance, $t(269) = -5.95, p < .001$.

Table 8

Means for AP Class Marks and AP Exam Scores

	<i>n</i>	Mark		Exam	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
All AP Students	270	2.90	0.97	2.10	0.91
First-time AP Students	156	2.64	0.97	1.83	0.80
Previously Enrolled AP Students	114	3.25*	0.84	2.46*	0.93
TU First-time AP Students	65	2.39	1.08	1.73	0.83
CR First-time AP Students	91	2.82*	0.86	1.91	0.83

Note. Only 11th and 12th grade AP students are included. TU = traditionally underrepresented AP students who identify with one or more of the following: economically disadvantaged, Hispanic, or two or more races. CR = commonly represented AP students are not economically disadvantaged and identify as Asian or White. Statistically significant differences are between the two subgroups.

* $p < .01$

Also shown in Table 8 are the subgroups of first-time traditionally underrepresented and first-time commonly represented AP students. For this study, traditionally underrepresented (TU) students were from lower socioeconomic families, or they identified as being Hispanic, or being from two or more races. Commonly represented (CR) students were from middle to upper socioeconomic families and identified as White or Asian (see Figure 3). When comparing these two subgroups, first-time CR students had a 0.43 higher mean for marks in AP courses and performed better on the AP exam by 0.18 points than first-time TU students. An independent samples *t*-test revealed that first-year commonly represented AP students outperformed first-year traditionally underrepresented AP students on their marks by a statistically significant amount, $t(154) = 2.81, p = .006$. However, there was not a statistical

significance in how students from the two subgroups performed on their AP exams ($p > .05$).

Upper Socioeconomic	CR	CR	TU	TU
Middle Socioeconomic	CR	CR	TU	TU
Lower Socioeconomic	TU	TU	TU	TU
	Asian	White	Hispanic	Two or More Races

Figure 3. Commonly represented AP students (CR) are from middle to upper socioeconomic status families, and are Asian or White and traditionally underrepresented AP students (TR) are from lower socioeconomic status, or they identify as being Hispanic or from two or more races.

Pearson correlation coefficient analyses were computed to assess the relationship between marks earned in the AP course and the score earned on the corresponding AP exam. As shown in Table 9, there was a statistically significant correlation between the marks students earned in the AP course and the score they earned on the exam for all subgroups except CR first-time AP students. However, the strengths of the relationships were all weak with the with R^2 values ranging from 3% to 12%. A large percent of the variance between grades and marks remains unaccounted for.

Table 9

Pearson's Correlation Coefficients for Marks and Grades

	<i>n</i>	<i>r</i>	<i>R</i> ²	<i>p</i>
All Students	270	0.34	11%	<.001
First-Time AP Students	156	0.28	8%	.001
Previously Enrolled AP Students	114	0.26	7%	.006
TU First-Time AP Students	65	0.34	12%	.005
CR First-Time AP Students	91	0.18	3%	.080

Note. TU = traditionally underrepresented first-time AP students, CR = commonly represented first-time AP students.

Research Question #2: Supports and Barriers for First-Time AP Students

The second research question focused only on students who were taking an AP class for the first time. This section will provide analysis results of the 81 students who completed an end-of-year survey about their experiences in their AP course. Of these students, 49 had completed their first year in an AP class, and 32 had taken an AP course in a previous year. When asked to identify their level of agreement to the statement “students like me are welcome in AP classes” on a 6-point Likert-type scale with 1 being strongly disagree and 6 being strongly agree, the mean was 4.94 (*SD* = 1.01) for first-year AP students and 4.91 (*SD* = 0.96) for repeat AP students. In order to see trends in the data, the scores of 1, 2, and 3 were combined into a “disagree” category, and the scores of 4, 5, and 6 were combined into an “agree” category. Of the first-year AP students, 90% agreed that students like them were welcome in their AP class. For students who had been in an AP class previously, there was 91% agreement.

Elements first-year AP students believe helped them succeed. Students responded to a series of four questions on the end-of-year survey identifying what they believed helped them succeed in AP classes. Each response was on a 5-point Likert-type scale where “not important at all” was a 1, “not very important” was a 2, “unsure” was a 3, “somewhat important” was a 4, and “very important” was a 5. Scores of 1 and 2 were combined to create a “not important” category, and scores of 4 and 5 were combined to create an “important” category. Results are shown in Table 10.

For students who were in their first year of AP, 92% attributed their success to adults at the school helping them feel engaged and welcomed in the AP class. This was rated as important to their success by 88% of students who had taken classes AP previously. This was the highest rated of the four items for students who had enrolled in AP classes previously. Both subgroups thought it was important to their success for AP teachers to provide a greater variety of teaching supports and strategies to fit their learning needs. The mean for the first-year students was 4.47 and for repeat AP students was 4.16. Even though there was a difference, it was not statistically significant. The highest rated item for first-year AP students was the AP teacher believed in the student, with 96% indicating this as important. However, this was the third highest out of four items for the students who had been in AP classes previously, with 75% believing it was important. There was a statistically significant difference between the two groups on this item, $t(79) = 3.43, p = .001$.

The only item where the means for either group did not reach the “important” range on the scale, from 4 to 6, was their AP teachers connecting their parents, family, or culture with their learning in AP class (see Table 10). The mean for first-year AP

students was 3.47, corresponding to the “unsure” range with 64% of students rating it as important. For repeating AP students the mean was 2.72, which was in the “disagree” range, and only 38% believed it to be important. When comparing means with an independent sample *t*-test between first-year AP students and repeat AP students, there was a statistically significant difference between the two groups, $t(79) = 2.23, p = .03$.

Table 10

Importance of Items in Helping First-Year AP Students Succeed

Question	Group	<i>M</i> (<i>SD</i>)	Median	Not Important	Important	Unsure
Adults at your school helped you feel engaged and welcomed in AP classes.	1 st Year	4.41 (0.76)	5.0	4%	92%	2%
	Not 1 st Year	4.13 (1.13)	4.0	12%	88%	0%
Adults at your school connected your parents, family and/or culture with your learning in AP classes.	1 st Year	3.47 (1.50)	4.0	32%	64%	4%
	Not 1 st Year	2.72* (1.44)	2.0	57%	38%	3%
Adults at your school provided a greater variety of teaching supports and strategies to fit your learning style in AP classes.	1 st Year	4.47 (0.92)	5.0	6%	90%	4%
	Not 1 st Year	4.16 (1.17)	4.5	12%	85%	3%
Adults in AP classes showed you that they believe in you.	1 st Year	4.71 (0.54)	5.0	0%	96%	4%
	Not 1 st Year	4.00* (1.30)	4.5	19%	75%	6%

Note. There were 49 1st year students and 32 not 1st year students.

* $p < .01$

Student reflections on AP classes. Students were asked to what extent they agreed with 11 statements that related to their experience in AP classes. The rating was on a 6-point Likert-type scale with 1 being strongly disagree to 6 being strongly

agree. Scores of 1, 2, and 3 were combined to create the “disagree” category shown in Table 11, and scores of 4, 5, and 6 were combined to create the “agree” category to establish patterns in the data.

AP community. Eighty percent of first-year students and 84% of students who were in AP classes previously agreed they felt like part of the community in their AP classes. The ways they preferred to communicate and learn were respected for 78% of first-year students, but only 69% of repeat AP students agreed this was true. Both groups agreed at 90% or above that students like them (e.g. race or gender) were treated fairly by other AP students. For first-year AP students, 76% felt they shared common interests and values with other AP students. This was higher (94%) for students who had been in an AP class before. Both first-time AP students and those that were previously enrolled in AP classes felt welcomed by other students in their AP class, 80% for first-time students and 90% for those who were in AP previously.

Table 11

First-Year AP Student Experiences in AP Class

Statement	Group	<i>M (SD)</i>	Median	Disagree	Agree
I feel like a part of a community in AP class.	1 st Year	4.27 (1.12)	4	20%	80%
	Not 1 st Year	4.56 (0.98)	5	16%	84%
The ways I prefer to communicate and learn are respected.	1 st Year	4.31 (1.10)	4	22%	78%
	Not 1 st Year	4.25 (1.14)	4	31%	69%
Students like me (e.g. my race, my gender) are treated fairly by other AP students.	1 st Year	5.18 (0.99)	5	10%	90%
	Not 1 st Year	5.16 (1.05)	5	9%	91%
I share common interests and values with other AP students.	1 st Year	4.53 (1.29)	5	24%	76%
	Not 1 st Year	4.84 (0.85)	5	6%	94%
Other students make me feel welcome in AP classes.	1 st Year	4.57 (1.17)	5	20%	80%
	Not 1 st Year	4.53 (1.08)	4	9%	91%
I am comfortable asking for help from AP teachers when I need it.	1 st Year	4.59 (1.35)	5	18%	82%
	Not 1 st Year	4.50 (1.24)	5	19%	81%
I am comfortable asking for help from other AP students when I need it.	1 st Year	4.69 (1.16)	5	18%	82%
	Not 1 st Year	4.94 (0.95)	5	6%	94%
Compared to my peers, I feel like I have to prove myself to AP teachers.	1 st Year	3.29 (1.37)	4	49%	51%
	Not 1 st Year	3.94* (1.24)	4	28%	72%
Compared to my peers, I feel like I have to prove myself to other AP students.	1 st Year	3.31 (1.43)	3	55%	45%
	Not 1 st Year	3.94 (1.50)	4	28%	72%
My AP teachers believe that I am capable of succeeding in class.	1 st Year	4.80 (1.10)	5	12%	88%
	Not 1 st Year	4.72 (1.09)	5	12%	88%
Students in my AP classes believe that I am capable of succeeding in class.	1 st Year	4.10 (1.30)	4	35%	65%
	Not 1 st Year	4.38 (1.21)	4	19%	81%

Note. 1st year students $n=49$, Not 1st year students $n=32$.

* $p < .05$

Confidence in AP. When first-year students needed help in their AP class, 80% agreed they were equally comfortable asking the teacher or other students in the class. Students who were previously in AP classes gave a similar response about asking the AP teacher for help, but they increased their agreement to 94% around their comfort in asking for help from other AP students. First-year AP students were fairly neutral on feeling they needed to prove themselves to AP teachers, with a 49% to 51% split on disagreeing and agreeing with the statement. However, 72% of students who had taken AP courses prior to this year were in agreement that they had to prove themselves to AP teachers. The difference on the means for the two groups in feeling they had to prove themselves to the AP teacher was statistically significant, $t(79) = 2.17, p = .03$.

When asked "compared to my peers, I feel like I have to prove myself to other AP students," 45% of the first-year students agreed and 72% of the repeat AP students agreed; this was not a statistically significant difference. Students from both groups felt their AP teachers believed they were capable of succeeding in class (88%). Only 81% of the students who had been in AP classes previously felt that other students in the AP class believed they were capable of success compared to 65% of first-time AP students.

Student reflections on classes other than AP. Students were asked nine similar questions about how it feels to be in non-AP classes. The same 6-point Likert-type scale was used. The lower three scores were combined to create the disagree category, and the top three were combined to create the agree category.

Class community. When asked if they felt part of the community in classes that were not AP, 70% of first-time AP students agreed, while 75% of students who had previously taken AP classes agreed (see Table 12). For both groups, about 85% felt that students like them (e.g. race and gender) are treated fairly by adults in the classes. There was a slight decrease in agreement to 80% for first-time AP students being treated fairly by other students. However, for students who had been in AP classes previously, agreement increased to 90% when it came to being treated fairly by other students. Similarly, 73% of first-time AP students shared common interests and values with students in their other classes compared to 82% of students who were enrolled in AP classes previously.

Class confidence. For first-year AP students approximately 80% agreed that they were comfortable asking for help from teachers in classes other than AP as well as from other students in these classes (see Table 12). For repeating AP students, the comfort of asking other students for help in other classes rose to 91%. A higher percentage of students who had been in AP classes previously, 56%, agreed they needed to prove themselves to teachers in other classes, compared to 36% of first-time AP students; this was not statistically significant when means were analyzed.

Compared to their peers in their other classes, 32% of first-time AP students felt they had to prove themselves to other students in their classes. Students who had been in AP classes previously responded with 62% agreeing they had to prove themselves to other students. The difference in means was statistically significant $t(79) = -2.20, p = .03$. Students from both groups (84%) agreed their teachers in classes other than AP believed they were capable of succeeding in class. The statement “other

students in my AP class believe I am capable of succeeding” matched the 84% agreement for the repeating AP students, but dropped to 76% for first-time AP students.

Table 12

First-Year AP Student Experiences in Classes Other than AP

Statement	Group	<i>M(SD)</i>	Median	Disagree	Agree
I feel like a part of a community in class.	1 st Year	4.24 (1.22)	4	30%	70%
	Not 1 st Year	4.19 (1.40)	4	25%	75%
Students like me (e.g. my race, my gender) are treated fairly by adults in classes.	1 st Year	5.02 (1.13)	5	14%	86%
	Not 1 st Year	4.97 (1.23)	5	15%	85%
Students like me (e.g. my race, my gender) are treated fairly by other students.	1 st Year	4.78 (1.24)	5	18%	82%
	Not 1 st Year	5.13 (1.01)	5	9%	91%
I share common interests and values with other students.	1 st Year	4.35 (1.22)	5	27%	73%
	Not 1 st Year	4.38 (1.24)	5	18%	82%
I am comfortable asking for help from my teachers when I need it.	1 st Year	4.57 (1.31)	5	18%	82%
	Not 1 st Year	4.53 (1.37)	5	22%	78%
I am comfortable asking for help from other students when I need it.	1 st Year	4.59 (1.03)	5	20%	80%
	Not 1 st Year	4.69 (1.03)	5	9%	91%
Compared to my peers, I feel like I have to prove myself to teachers.	1 st Year	3.06 (1.42)	3	64%	36%
	Not 1 st Year	3.63 (1.45)	4	44%	56%
Compared to my peers, I feel I have to prove myself to other students.	1 st Year	2.86 (1.41)	3	68%	32%
	Not 1 st Year	3.56* (1.41)	4	38%	62%
My teachers believe that I am capable of succeeding in class.	1 st Year	4.78 (1.26)	5	16%	84%
	Not 1 st Year	4.66 (1.26)	5	16%	84%
Students in my classes believe that I am capable of succeeding in class.	1 st Year	4.41 (1.32)	5	24%	76%
	Not 1 st Year	4.59 (1.16)	5	16%	84%

Note. 1st Year $n = 49$, Not 1st Year $n = 32$.

* $p < .05$

Being in an AP class compared to other classes. Since matching questions were asked of students about their experiences in AP class and in other classes, paired-sample t -tests were used to determine if differences existed for students in their AP classes versus their other classes. First-year AP students had statistically significant differences in their responses for two of the nine statements. They felt a greater need to prove themselves to other AP students than they did to students in other classes, $t(48) = 2.763, p = .01$. Also, when asked if students like them (e.g. my race, my gender) were treated fairly by other students, there was statistically significant higher agreement in their AP class than there was in other classes, $t(48) = 2.862, p = .01$.

Through the same analysis for students who had been previously enrolled in AP classes, there were three responses with statistically significant differences in the level of agreement. In their AP class, they felt more like a part of a community than they did in other classes, $t(31) = 2.104, p = .04$. With this result, it is not surprising that they also shared more common interests and values with other AP students than they did with students in other classes, $t(31) = 3.016, p = .01$. Similar to first-year AP students, they felt a greater need to prove themselves to other AP students than they did to students in other classes, $t(31) = 2.175, p = .04$.

Students were also asked on the survey to provide three words that described how it felt being in an AP class compared to other classes. Some students provided three words, while others gave fewer, resulting in 213 descriptors total. The most frequent words used were challenging and hard work. Words with similar meanings were combined and their frequencies tallied. Table 13 shows all of the descriptors provided, coded into positive, neutral, and negative descriptions.

Table 13

Student Description of AP Class Compared to Other Classes

Positive Description	<i>n</i>	Neutral Descriptions	<i>n</i>	Negative Descriptions	<i>n</i>
Interesting, engaging, inquisitive, intriguing, meaningful, compelling, dynamic, intuitive, involved	19	Challenging, difficult, vigorous, rigorous, tough	35	Stressful, give up	9
Successful, capable, proud, accomplished, accomplishment, achievement, worthy, effective, thriving, strong	14	Hard work, intensive	25	Time-consuming, time-management	7
Fun/enjoyable	11	More homework, study	9	Terrifying	2
Rewarding, worthwhile, useful, valuable, prepared	9	Moves faster, accelerated	6	Tiring	2
Determined, disciplined, more driven, motivated	8	Focused, attentive, concentrated	6	Confusing	1
Smarter, Intelligent, bright, ability	8	Advanced, expand, important	5	Frustrating	1
Need dedication, commitment	6	Busy	1	Hell on earth	1
Better, good	6	Different	1	Judgmental	1
Independent, self-motivating, responsible	4	Tests & quizzes	1	Less Help	1
Learning, educational	3			Nuisance	1
Sophisticated	2			Sad	1
Welcome, united	2			Scream	1
Easy	1				
Efficient	1				
Respectful	1				
Support	1				

Note. Words with similar meanings were grouped.

There were 96 positive descriptions with the most common falling into the category as interesting and engaging. Second most frequent were words describing success or an accomplishment. The neutral category contains descriptors that did not

fit in either the positive or negative category or could be considered positive or negative depending on their use. There were a total of 89 neutral descriptors provided. With only a word as a description, the context was not clear. For instance, hard work or intensive were given 25 times. It is not clear if the students who gave these responses enjoyed the hard work and the intensity of the course or if they were bothered by the demands of the course. Some of the other common neutral responses were challenging, rigorous, accelerated, and different.

The negative responses indicated the student identified with the course in an adverse manner. Of the 28 negative responses, the word stressful was nearly a third of them. The concepts of time-consuming and time-management were provided seven times. Some of the other singular negative responses were frustrating, confusing, and judgmental.

Research Question #3: Traditionally Underrepresented First-time in AP

The third research question focused on traditionally underrepresented students who took an AP class for the first time. The group of first-year students was divided into two subgroups, traditionally underrepresented students and commonly represented students. Of the 49 first-year students from the previous research question, 20 students either came from families that were economically disadvantaged, identified as Hispanic, or identified as being from two or more races. No students identified as Black in the first-year group. In this study these students were referred to as traditionally underrepresented (TU) in AP classes. The other subgroup used for comparison purposes consisted of 29 commonly represented (CR) students who came from middle to upper socioeconomic families, and they identified as White or Asian.

This section will provide analysis results of these 49 first-year students who completed a survey at the end of the school year.

When asked to identify their level of agreement to the statement “students like me are welcome in AP classes” on a 6-point Likert-type scale with 1 being strongly disagree and 6 being strongly agree, the mean was 5.15 ($SD = 1.04$) for TU AP students and 4.79 ($SD = 0.99$) for CR students in AP classes. When the scores of 1, 2, and 3 were combined into a “disagree” category and the scores of 4, 5, and 6 were combined into an “agree” category, 90% of the students from both subgroups agreed that students like them are welcome in their AP classes.

Elements traditionally underrepresented AP students believe helped them succeed. Students responded on an end-of-year survey to a series of four questions identifying what they believed helped them succeed in AP classes. Each question was on a 5-point Likert-type scale where “not important at all” was a 1, “not very important” was a 2, “unsure” was a 3, “somewhat important” was a 4, and “very important” was a 5. Scores of 1 and 2 were combined to create a “not important” category, and scores of 4 and 5 were combined to create an “important” category, shown on Table 14.

Of the four statements, three of them were important to 95% of the TU students. The remaining 5% were unsure, so no first-year students said these were not important. The means for each of these was 4.55 to 4.80 out of 5 points. First, it was important for adults to help them feel engaged and welcomed in the AP class. Second, teachers needed to provide a greater variety of teaching and supports to fit their learning style in AP classes. The last statement with 95% agreement from TU students

was that they needed AP teachers to show that they believed in them. The first two of these statements had a lower percentage of agreement for CR students, 89% and 87%, respectively. The third statement, having “AP teachers show that they believed in them,” was the highest rated for the CR students at 97% agreeing this was important for their success in AP class. The only statement whose mean (3.60 and 3.38) was in the unsure range was “adults at your school connected your parents, family and/or culture with your learning in AP classes.” For TU students 65% felt this was important and 62% of the CR students believed it to be important. For each of these four statements statistically significant differences were not present.

Table 14

Traditionally Underrepresented First-Year AP Student Supports

Question	Group	<i>M (SD)</i>	Median	Not		
				Important	Import.	Unsure
Adults at your school helped you feel engaged and welcomed in AP classes.	TU	4.55 (0.61)	5	0%	95%	5%
	CR	4.31 (0.85)	4	8%	89%	3%
Adults at your school connected your parents, family and/or culture with your learning in AP classes.	TU	3.60 (1.43)	4	30%	65%	5%
	CR	3.38 (1.57)	4	35%	62%	3%
Adults at your school provided a greater variety of teaching supports and strategies to fit your learning style in AP classes.	TU	4.55 (0.61)	5	0%	95%	5%
	CR	4.41 (1.09)	5	10%	87%	3%
Adults in AP classes showed you that they believe in you.	TU	4.80 (0.52)	5	0%	95%	5%
	CR	4.66 (0.55)	5	0%	97%	3%

Note. TU = Traditionally Underrepresented AP students ($n=20$); CR= Commonly Represented AP Students ($n=29$).

AP class experiences for traditionally underrepresented AP students.

Students were asked 11 questions about their experiences in their AP classes. Each question was on a 6-point Likert-type scale ranging from strongly disagree to strongly agree. Responses falling into the lower half of the scale were combined into the disagree category and responses in the top half were combined into the agree category, shown on Table 15. Even though differences occurred in the percentages of agree and disagree for the two groups of students, none of the differences in the means were statistically significant. The two subgroups in Table 15 can be combined with the first year AP students' experiences in Table 11, to see an overall analysis for first-year students, and the disaggregation into TU and CR subgroups.

AP class community for traditionally underrepresented AP students. In all of the five statements that described a connection with the AP class community, more TU students responded in agreement than the CR students (Table 15). Overall, 80% of TU students agreed that they felt like a part of the AP class community, whereas 66% of the CR students agreed they were part of the class community. TU students agreed at a higher percentage (85%) that the ways they preferred to communicate and learn were respected, compared to only 72% of the CR students. The highest rate of agreement for TU students, 95%, was that students like them (e.g. my race or gender) were treated fairly by other students. Sharing common interest and values with other AP students was similar for both TU and CR students, with approximately 75% of students in agreement. TU students agreed that they felt welcomed by other students in AP classes at a higher rate (85%) than CR students (76%).

Table 15

Traditionally Underrepresented First-Year AP Student Experiences in AP Class

Statement	Group	<i>M (SD)</i>	Median	Disagree	Agree
I feel like a part of a community in AP class.	TU	4.20 (1.28)	4	20%	80%
	CR	4.31 (1.17)	4	34%	66%
The ways I prefer to communicate and learn are respected.	TU	4.35 (0.88)	5	15%	85%
	CR	4.28 (1.25)	4	28%	72%
Students like me (e.g. my race, my gender) are treated fairly by other AP students.	TU	5.30 (0.80)	5	5%	95%
	CR	5.10 (1.13)	6	23%	77%
I share common interests and values with other AP students.	TU	4.65 (1.23)	5	25%	75%
	CR	4.45 (1.35)	5	24%	76%
Other students make me feel welcome in AP classes.	TU	4.75 (1.16)	5	15%	85%
	CR	4.45 (1.18)	4	24%	76%
I am comfortable asking for help from AP teachers when I need it.	TU	4.30 (1.30)	4.5	20%	80%
	CR	4.79 (1.37)	5	16%	84%
I am comfortable asking for help from other AP students when I need it.	TU	4.60 (1.23)	5	30%	70%
	CR	4.76 (1.12)	5	13%	87%
Compared to my peers, I feel like I have to prove myself to AP teachers.	TU	3.55 (1.28)	4	40%	60%
	CR	3.10 (1.42)	3	55%	45%
Compared to my peers, I feel like I have to prove myself to other AP students.	TU	3.40 (1.31)	3	55%	45%
	CR	3.24 (1.53)	3	56%	44%
My AP teachers believe that I am capable of succeeding in class.	TU	4.65 (1.18)	5	10%	90%
	CR	4.90 (1.05)	5	12%	88%
Students in my AP classes believe that I am capable of succeeding in class.	TU	4.05 (1.36)	4	35%	65%
	CR	4.14 (1.27)	4	34%	66%

Note. TU= traditionally underrepresented first-year AP students ($n = 20$), CR = commonly represented first-year AP students ($n = 29$).

AP class confidence for traditionally underrepresented AP students. More TU students were comfortable asking for help from their AP teacher (80%) than other students in the AP class (70%). The opposite was true for CR students. They felt less comfortable asking for help from the AP teacher (84%) than they did asking other AP students for help (87%). Compared to their peers in AP class, their level of agreement

on feeling the need to prove themselves to other AP students was similar, TU was at 45%, and CR were at 44%. However, more TU students (60%) agreed they felt they needed to prove themselves to their AP teacher. CR students remained below 50%. Approximately 90% of the students in both groups agreed that their AP teacher believed that they were capable of succeeding in class. Table 15 shows when this is changed to other students in their AP class believing in them, only 2 out of 3 students, approximately 66%, in both groups agreed with the statement.

Traditionally underrepresented AP students in other classes. The same questions were asked for classes that were not AP. Again, when comparing the means of the two groups using an independent sample *t*-test, there were no statistically significant differences. The full analysis is shown on Table 16.

Community in classes other than AP for traditionally underrepresented AP students. More students who were part of the TU subgroup (75%) felt a part of the community in other classes than students from the CR subgroup, 66% (see Table 16). More TU students felt students like them were treated fairly by adults in other classes (90%) than by students in their other classes (85%). Eighty percent of the CR students were in agreement with both statements. Fewer TU students felt they shared common interests and values with students in other classes, 80%, compared to 90% of CR students.

Table 16

Traditionally Underrepresented First-Year AP Student Experiences in Other Classes

Statement	Group	<i>M (SD)</i>	Median	Disagree	Agree
I feel like a part of a community in class.	TU	4.40 (1.10)	5	25%	75%
	CR	4.14 (1.30)	4	34%	66%
Students like me (e.g. my race, my gender) are treated fairly by adults in classes.	TU	5.35 (0.81)	5.5	5%	95%
	CR	4.79 (1.26)	5	20%	80%
Students like me (e.g. my race, my gender) are treated fairly by other students.	TU	4.95 (1.05)	5	15%	85%
	CR	4.66 (1.37)	5	20%	80%
I share common interests and values with other students.	TU	4.70 (1.13)	5	20%	80%
	CR	4.10 (1.24)	4	30%	70%
I am comfortable asking for help from teachers when I need it.	TU	4.75 (1.12)	5	15%	85%
	CR	4.45 (1.43)	5	20%	80%
I am comfortable asking for help from other students when I need it.	TU	4.70 (1.30)	5	25%	75%
	CR	4.52 (1.12)	4	17%	83%
Compared to my peers, I feel like I have to prove myself to teachers.	TU	3.30 (1.56)	3	55%	45%
	CR	2.90 (1.32)	3	69%	31%
Compared to my peers, I feel like I have to prove myself to other students.	TU	3.00 (1.45)	3	60%	40%
	CR	2.76 (1.41)	3	73%	27%
My teachers believe that I am capable of succeeding in class.	TU	5.00 (1.17)	5	15%	85%
	CR	4.62 (1.32)	5	16%	84%
Students in my classes believe that I am capable of succeeding in class.	TU	4.75 (1.07)	5	15%	85%
	CR	4.17 (1.44)	4	31%	69%

Note. TU= First-year, traditionally underrepresented AP students ($n=20$), CR = first-year, commonly represented AP students ($n= 29$).

Confidence in classes other than AP for traditionally underrepresented AP

students. As seen on Table 16, TU students were more comfortable asking for help from teachers (85%) than from other students (75%) in their non-AP classes.

However, students in the CR group preferred to ask their peers (83%) in other classes for help than their teachers (80%). Forty percent of the TU students felt they had to prove themselves to other students, which increased to 45% feeling the need to prove themselves to their teachers in classes other than AP. The same was true for CR students, but at a lower rate of agreement. The need to prove themselves to other students was 27%, and 31% felt they needed to prove themselves to their teachers.

AP class compared to other classes for traditionally underrepresented students. A paired-sample *t*-test was completed on the means of student responses to matching questions in order to determine if a statistically significant difference existed for traditionally underrepresented students with their experience in AP classes compared to their experience in other classes.

Traditionally underrepresented first-year AP students had statistically significant differences in their responses for only one of the nine statements. The need to prove themselves to other students was greater in the AP class than it was in their other classes, $t(19) = -2.405, p = .03$. In comparison, commonly represented first-year AP students had statistically significant differences on two of the nine statements. They, too, felt a greater need to prove themselves to other students in their AP class than they did to students in other classes, $t(28) = 2.853, p = .01$. In addition CR students also felt students like them (e.g. my race, my gender) were treated more fairly by other AP students than by students in other classes, $t(28) = 2.451, p = .02$.

Student interviews. To learn more about what helped them succeed and the challenges they faced during their first year in an AP class, five students from the traditionally underrepresented subgroup participated in a semi-structured interview.

Students were asked what lessons, activities, or instructional strategies used by their AP teachers helped them learn the most in the class. Three themes emerged from their responses: instructional strategies and activities, collaboration with peers, and the teacher. Four out of the five students talked about being engaged in the AP class when there were activities such as hands-on labs, mock elections, and going outside to complete a field study. Two of the students said increasing their understanding of effective writing, “having examples of essays we were going over because then you can actually see it and it’s a tangible thing,” and building their stamina when writing were beneficial, “we had to write an essay in 40 minutes and being able to practice that helped to get it done on time.”

All five students also mentioned collaborating with their peers enhanced their learning during the AP class. The friendliness of the other students in class, the group projects they completed, and the study groups created were examples of students working together to deepen their understanding of the content. Two of the students said the teacher was the reason they were successful in the AP class. One student talked about how, when taking notes on new content, the teacher “would show us visually, she would write it, and also draw it.” Another said the “teacher helps you comprehend well, she knows you and pushes you to do well because she knows your potential.” The student went on to say the teacher would never just give the answer to a question. “She would make you work through it in your mind. That really helps you get on track because then you think, ‘I really know how to think about these things’.”

Students were also asked about the challenges they faced in the AP class and whether they were able to overcome them during the school year. The ability to

manage their time was mentioned by three of the five students. They said this was an issue throughout the year until the AP test was complete. One student said it was the worst in the spring when they were getting ready for the AP test. Note-taking abilities was mentioned as a challenge by two students. One said that when it was time to take notes on new information “it wasn’t very interactive. The teacher just talked at us, showed videos, and made us take notes like copying down word for word what was on the slide show.” This student still finds it challenging to take notes in current classes. The other student who mentioned note taking as a challenge talked about the note taking process as being boring and it was hard to pay attention during this time. She said she feels her note taking abilities improved and she can do it fine now, but does not feel that her notes really help her. She learns more from listening to the teacher.

Three of the five students stated that the difficult content was the biggest challenge to overcome. Specifically mentioned were the math that was needed, being able to write an essay in a set amount of time, and figuring out how the quizzes and tests worked in the class. One student commented, “at first it was really difficult to comprehend. The first semester I didn’t understand it, only half-way and I couldn’t apply it to my work.”

One student said her biggest challenge was going into the school year thinking she could not be successful in the class. She said at the beginning of the year she was constantly thinking, “I can’t do this.” She said her confidence was boosted by the end of the course because she realized she can be successful in the class, and she was.

Research Question #4: Changes in First-Year AP Students Perceptions of Themselves

As discussed in Chapter 3, there was a focus at the school to recruit and enroll traditionally underrepresented students in an Advanced Placement course based on their performance in core content classes and on state assessments, teacher recommendations, and their responses to a survey given to all students in the school. The goal was to have their AP student population representative of the entire student body. Many of these first-year AP students may not have thought they should enroll in an AP course prior to recruitment efforts at the school.

Survey results. In order to determine if there was a change in how first-year AP students saw themselves as academic individuals, survey data were analyzed for students from the pre-AP survey and post-AP survey. As with other analyses in this study, traditionally underrepresented (TU) students were from economically disadvantaged families, or identified as Hispanic or as being from two or more races. Commonly represented (CR) students were from middle to upper class homes, and identified as White or Asian. Since only students with responses from both the pre-survey and post-survey could be included, there were 17 TU students and 23 CR students.

Growth mindset. Four questions on the survey asked students to indicate their level of agreement on a 6-point Likert-type scale with statements about a person's ability to gain or grow their intelligence. When the mean of student responses was calculated for a question, three or below was in the "disagree" range of the scale, and a

mean of 4 or higher was in the “agree” range of the scale. Table 17 shows student responses for first-year TU AP students and first-year CR students in AP.

There were two statements describing a fixed mindset. These referred to not being able to change the amount of one’s intelligence or the ability to change how smart a person is. Means of both post-survey responses showed a stronger disagreement from the pre-survey, showing a slight shift towards a growth mindset. Conversely, student responses to statements that were worded in support of a growth mindset, one’s ability to change their intelligence, also decreased from the pre-survey to the post-survey. The means for the statement “it’s possible not just to learn more, but to get smarter as well” decreased from 5.18 to 4.82 for traditionally underrepresented students and from 5.26 to 4.78 for commonly represented students. These changes were a shift towards a fixed mindset, but were not statistically significant ($p > .05$). ANCOVAs were also run on all items to compare the two groups and changes from the pre-survey to the post-survey, but none of the differences were statistically significant ($p > .05$). See results in Table 17.

Grit. Three questions on the survey were about the ability to stick with a purpose or a goal over a long period of time, often referred to as grit. For the statement “I am a hard worker” both groups had means above 5 for the pre-survey. On the post survey the mean for each group was 4.50, which was a statistically significant ($p < .05$) decrease for both groups. The effect size was also moderate in both groups (TU: $d = .59$, CR: $d = .66$). Pre- and post-survey results for both groups of students had means on the disagreement range of the scale for “I am discouraged by hardships”. The means for CR students decreased for the statement by 0.17, while the mean for

students in the TU group increased by 0.12. Shown on Table 17, this was the only increase for any of the academic identity self-growth survey questions.

Academic self. The three statements on the pre- and post-surveys that measured the student's academic self were "I'm doing well in school," "I'm getting good grades," and "I understand the material in my classes." On the pre-survey both TU and CR subgroups had means over 5 on a 6-point scale for each statement. These decreases on the post-surveys ranged from 0.44 to 1.06. The largest decrease in means, 1.06 points, for TU students was on the statement "I'm getting good grades." This change was statistically significant ($p < .001$) with a strong effect size ($d = 1.14$). TU students also had a statistically significant decline ($p < .001$) in their agreement for the statement "I'm doing well in school," decreasing in means from 5.41 to 4.41. The practical effect size was strong, $d = 1.07$. The decrease in means for understanding the material in classes was also statistically significant ($p = .01$) for TU students with a strong effect size ($d = 1.01$).

The remaining first-year AP students, the CR group, also had statistically significant ($p < .05$) decreases in means and moderate effect sizes: (a) "I'm doing well in school," $d = .57$ and (b) "I'm getting good grades," $d = .58$. The decrease in the mean (0.44) was not statistically significant for CR students on "I understand the material in my classes."

Table 17

Mean Growth in Academic Identity

Survey Question	Group	Pre-AP <i>M(SD)</i>	Post-AP <i>M(SD)</i>	Cohen's <i>d</i>	Change	<i>F</i>
Growth Mindset						
I have a certain amount of intelligence and I can't do very much to change it.	TU	2.76(1.48)	2.18(0.88)	0.48	-0.59	0.37
	CR	2.48(1.38)	2.35(1.47)	0.09	-0.13	
It's possible not just to learn more, but to get smarter as well.	TU	5.18(0.64)	4.82(1.02)	0.42	-0.35	0.06
	CR	5.26(0.54)	4.78(1.30)	0.48	-0.48	
I can learn new things, but I can't really change how smart I am.	TU	2.76(1.30)	2.59(1.28)	0.13	-0.18	0.02
	CR	2.43(1.08)	2.35(1.30)	0.07	-0.09	
No matter how much intelligence you have, you can always change it quite a bit.	TU	4.47(1.01)	4.47(1.01)	0.00	0.00	0.15
	CR	4.65(0.94)	4.43(0.95)	0.23	-0.22	
Grit						
I am a hard worker.	TU	5.12(0.70)	4.53(1.23)	0.59	-0.59**	0.09
	CR	5.17(0.65)	4.52(1.24)	0.66	-0.65*	
I am discouraged by hardships.	TU	3.18(0.88)	3.29(0.77)	-0.13	0.12	2.81
	CR	2.70(1.11)	2.52(1.34)	0.15	-0.17	
I finish whatever I begin.	TU	4.65(0.86)	4.47(1.07)	0.19	-0.18	0.26
	CR	4.96(0.77)	4.52(1.04)	0.48	-0.44	
Academic Self Asset						
Doing well in school.	TU	5.41(0.71)	4.41(1.12)	1.07	-1.00**	1.99
	CR	5.39(0.58)	4.87(1.14)	0.57	-0.52*	
Getting good grades.	TU	5.29(0.59)	4.24(1.15)	1.14	-1.06**	2.42
	CR	5.39(0.78)	4.83(1.11)	0.58	-0.57*	
Understand the material in my classes.	TU	5.12(0.70)	4.41(0.71)	1.01	-0.71*	0.44
	CR	5.00(0.80)	4.58(1.16)	0.42	-0.44	
Academic Strategies						
Using my time wisely.	TU	4.82(0.73)	3.93(1.14)	0.93	-0.88**	0.01
	CR	5.00(0.80)	4.09(1.28)	0.85	-0.91**	
Successfully handling problems that come my way.	TU	4.94(0.75)	4.12(0.86)	1.02	-0.82**	0.75
	CR	5.17(0.72)	4.52(1.08)	0.71	-0.65**	
Coping well with distractions.	TU	4.76(0.83)	3.82(1.02)	1.01	-0.94**	1.02
	CR	4.78(0.95)	4.17(1.30)	0.54	-0.61**	
Working hard to achieve my goal.	TU	5.59(0.62)	4.71(1.21)	0.92	-0.88**	0.65
	CR	5.57(0.51)	4.96(1.15)	0.69	-0.61**	

Note. TU= traditionally underrepresented students ($n=17$), CR= commonly represented students ($n=23$). Statistical significance identified through paired sample *t*-tests.

* $p < .05$, ** $p < .01$.

Academic strategies. Four of the statements on the survey measured students' academic strategies. Samples of the statements were "using my time wisely" and "successfully handling problems that come my way". On the pre-survey the highest means for both TU and CR groups was "I am working hard to achieve my goal" at 5.59 and 5.57 respectively. The mean for this item on the post-survey for TU students decreased by 0.88 and CR students decreased by 0.61, both statistically significant at $p < .01$. On these four statements, the largest decrease in means for TU students was coping well with distractions, going from 4.78 to 3.82. This change moved the TU students from mild agreement to mild disagreement on this statement. The change was statistically significant, $p = .009$, and had a strong effect size, $d = 1.01$. For the CR students the largest change in the mean scores was for using my time wisely, moving nearly a full point from 5.00 to 4.09, resulting in a statistically significant change, $p < .001$.

Student interviews. As part of the interview, students who were from the traditionally underrepresented subgroup were asked how they would rate their academic skills before they took an AP course. All five of the students responded that going into their first AP class, they felt their ability to read, write, and be organized were already good. They were successful in their other classes. Even though one student said she was not good at note taking and another mentioned not being good at taking tests, four out of the five students felt good about their abilities as they entered the AP class.

Students were also asked to describe the perception of their academic skills after they completed an AP course. Three of the students said they thought their

academic skills had improved after taking the AP course. “I understand questions a lot more. Sometimes they try to trick you with the wording and now I get the big idea and can answer the questions” was the response from one student. Another commented on improvement in her note taking skills and her ability to budget her time. The third student talked about mapping out a study plan for each test or large project. She said planning ahead helped her meet the deadlines. One out of the five students interviewed said her skills had not changed. The last of the students said that she would rate her academic skills after taking an AP course as less than before she took the class.

“Taking the AP course made me feel I didn’t know what I was doing. I had the skills to take the notes and do the work, but the AP work made me feel a little stupid and it really discouraged me.”

Students were asked if they could name at least one academic or personal skill they developed during the AP course. Two students named three skills, two named two skills and one student named one skill. Taking better notes was mentioned by two of the students, and two others said their time management has improved. Two students reported being able to answer questions better. “It taught me to look beyond the question, not just look at the facts that they give, but how they connect and all work together,” one student reflected. Other comments were “better at recognizing ways of writing essays,” “better able to understand what I learned and use it in the labs,” and “getting pretty good at guessing in getting ready for the AP test.” One student talked about the relationships she developed in the class and said from her time in AP class she learned to go to friends for help when she is stuck “because I know from that experience, we are all in this together.”

Research Question #5: Enrollment in Another AP Course

The final research question focused on whether students who were enrolled in an AP class for the first time planned to enroll in another AP course the following year. Survey responses and student interviews provided insight into the reasoning behind the decision. There were 81 students in the 11th or 12th grades who completed the post-AP survey. Of these students, 49 were just completing their first year in an AP class. Additional understanding was gained from the five students who participated in interviews.

Survey responses. On the post-survey students were asked if they planned on taking another AP course. Of the 49 first-year AP students, 59% responded that they would enroll in another AP course, while 22% said they would not. The remaining students were unsure at that time. Half of the 20 students in the traditionally underrepresented (TU) group responded that they would enroll in another AP course, compared to 66% of the 29 students in the commonly represented (CR) group.

All students were asked on the post-survey to choose from a provided list the top reasons that they would choose not to take an AP class in the future. Students could select up to three reasons or provide one of their own when responding “other”. The top reason selected by 47 of the 49 first-year students was they were worried it might hurt their GPA. The second most common response chosen by 32 students was “I don’t think I can be successful/get a good grade.” The list of choices and student responses are shown in Table 18.

Table 18

Reasons Students Would Choose not to Take Another AP Class.

<i>n</i>	Reason
47	I am worried it might hurt my GPA.
32	I don't think I can be successful/get a good grade.
30	I have competing priorities in my schedule that prevent me from taking AP classes.
24	I think AP classes are too much work.
13	I don't know if AP classes are worth my time.
12	I am not sure I could get the help I need to be successful.
9	I am not sure I would have classmates to study with or partner with for projects.
5	I don't think I've taken the right courses to qualify for another AP class.
4	I don't know teachers who teach AP.
	Other:
5	Not interested in any of the subjects or courses.
1	Cost of AP test.
1	My AP teacher this year made me think badly of AP.
1	The teacher will not set me up for success.
1	It is stressful to be absolutely "perfect".

Note. Reasons beneath the "Other" were provided as open-ended comments by the students. All other reasons were provided as a list for students to select up to 3.

Students were also asked to select up to three reasons from a provided list of responses to complete the statement "I would be more likely to take another AP class if: ". The top response selected by 33 students was that they could receive additional study and homework support. The second most common response, selected by 28 students was if they knew their class materials and AP exam fee would be paid for. The other responses and frequencies are provided in Table 19.

Table 19

Students Would be More Likely to Take Another AP Class if:

<i>n</i>	Reason
33	I could get extra study/homework support.
28	I knew my class materials and AP exam fees would be paid for.
24	I knew that I wouldn't have any homework over the summer.
24	I would receive special recognition at graduation.
23	I would have access to help from students who took the AP class before.
23	I knew there were option study skills trainings (e.g., working on time management, organization skills, etc.).
22	I knew that I would have classmates to study with or partner with for projects.
7	I'm graduating this year, so I won't be taking AP classes next year.
6	I could participate in a summer program to help prepare me for AP.
3	I could have transportation to/from school outside of normal school hours.
	Other:
2	If I knew colleges wanted students to take AP.
2	If I knew it would benefit me in the future.
2	If I was interested in the class subject.
1	It did not give homework that conflicts with other priorities such as sports.
1	If I could get an A.
1	If the teacher was good.

Note. Reasons beneath the "Other" were provided as open-ended comments by the students..

Some of the students also provided open-ended responses to explain their decision about enrolling into another AP course. Student responses for those who did plan on enrolling were:

- I want to challenge myself;
- I would like to earn more college credit and take a rigorous course;
- I'm taking AP Chemistry to pursue my interest in science further in a more advanced setting;

- I plan to take AP courses in classes involving social science;
- I feel like I can manage it;
- I enjoy the challenge and regular courses are nowhere near challenging enough;
- I just want to read "higher level" books and want a faster passed class;
- I plan on taking on a difficult work load senior year;
- I want to get as much college credit as I can before I go to college;
- I want to have the opportunity to earn college credit and save money; and
- I'm taking more because I can benefit the most out of these classes.

Of the 11 students that indicated that they would not enroll in another AP course, six were graduating. Those that were returning to the school provided the following explanations:

- I don't have any more tears to shed;
- I didn't learn anything and the tests were impossible;
- AP classes are kind of a waste because they are way harder and without the GPA scale being weighted it's more likely to be detrimental to your education;
- AP courses are difficult, create too much stress and take too much effort to achieve the grade I desire; and
- AP classes are too hard.

Nine out of the 49 first-year AP students were unsure if they would enroll in another AP course. Five of them provided the following reasons:

- I feel like I need to commit to it if I do;

- I'm not sure if it's worth it;
- They are hard work and stressful, but are very helpful;
- I don't like the teaching method; and
- I feel that I already have challenging classes and AP would be another challenge for me.

Students were also asked on the post-survey if they would choose to remain in the AP class or would they drop it if they were automatically enrolled in an AP class due to their test scores, grades, and/or teacher recommendations. Only 4% indicated that they would definitely drop the class. Out of the remaining 96%, 41% said they would stay, and 55% said they might stay.

Student interviews. During the student interviews, students were asked if they had enrolled in another AP class and their reason for that decision. Of the five students, three were enrolled in one or more AP classes the following year. One student said the basis for the decision to enroll in another AP class was that she wanted to read more; another student said the AP classes she was taking will help with her major in college; the third student responded “I think after taking AP classes last year I have a better expectation of what I should have to do in these classes. If the concepts get hard I already know ways to get past that.”

Of the two students who chose not to enroll in an AP class, one was enrolled in two dual credit classes instead, earning both high school and college credit for the same class. She said she did not feel prepared for the content in other AP classes available. The other student said she “found last year it was too difficult to juggle all the homework with the AP class and after school activities.”

Conclusion

In summary, the findings of this chapter provide an examination of perceptions from first-year Advanced Placement students. Through survey results and interviews, students were able to share their perspective on supports in the AP classes that helped them be successful, the challenges that they faced, and the shifts they experienced in how they saw themselves as academic individuals. Over 90% of first-year students felt welcome in their AP class.

There were many supports highlighted throughout the data analysis, but the factor that most helped them succeed was that the AP teacher believed that they could be successful in the class. The survey data and student interviews highlighted that students were challenged by the difficulty of the content of the classes, the amount of work, and managing their time. From the time they completed the pre-survey to when they completed the post-survey, there were statistically significant decreases in their perception of their grit, their academic self, and their academic strategies. This was true for first-year students who were traditionally underrepresented in AP classes and commonly represented AP students.

Overall, the majority of the first-year students said they would enroll in another AP course. A higher percentage of the commonly represented AP students planned to take another AP class as compared to those in the traditionally underrepresented subgroup. A summary of the results, a discussion of their implications in an educational setting, and recommendations for future research will be discussed in Chapter 5.

Chapter 5: Discussion

The purpose of this chapter is to present a summary of the significant findings from Chapter 4 and draw connections to current research. The discussion generally will follow the order presented by the five research questions that guided this study. Implications for educational practice and recommendations for future research in the area of student perceptions in AP courses also will be presented.

This explanatory study examined student perspectives for first-year and traditionally underrepresented first-year AP students. The specific perceptions investigated included the supports and challenges they experienced while participating in their first AP course and shifts in their academic identity while enrolled in the AP course. The study included 270 11th and 12th grade AP students from a suburban high school in the Pacific Northwest. Of these students, there were 81 participants who completed pre-AP and post-AP surveys. Following the analysis of the quantitative portion of the study, five traditionally underrepresented AP students who had completed their first year in an AP class were interviewed to gain a deeper understanding of results found from the survey data.

Discussion of Findings

The greatest importance of this research is the student perspective provided. First-year AP student perceptions were gathered from a pre-AP survey, a post-AP survey, and through interviews. Analyzing their viewpoints provided results showing their experiences both in their first-year AP class and in their other classes. Key findings will be presented to answer each of the study's five research questions.

First-year AP student performance. As expected, students who had been enrolled in AP during previous school years performed higher on both the marks they earned in their AP classes and the scores they earned on the AP exam when compared to first-year AP students (see Figure 4). This is not a new finding in this area and is in line with other studies (Edmunds & McCloskey, 2007; Long et al., 2012). When first-year students were separated into two subgroups, performance in the AP class was significantly lower for traditionally underrepresented students than for commonly represented students. Although traditionally underrepresented students also performed lower on the AP exam, this difference was not statistically significant. Lower performance in AP courses for traditionally underrepresented students is consistent with previous studies (College Board, 2014; Klopfenstein, 2004; Theokas & Saaris, 2013).

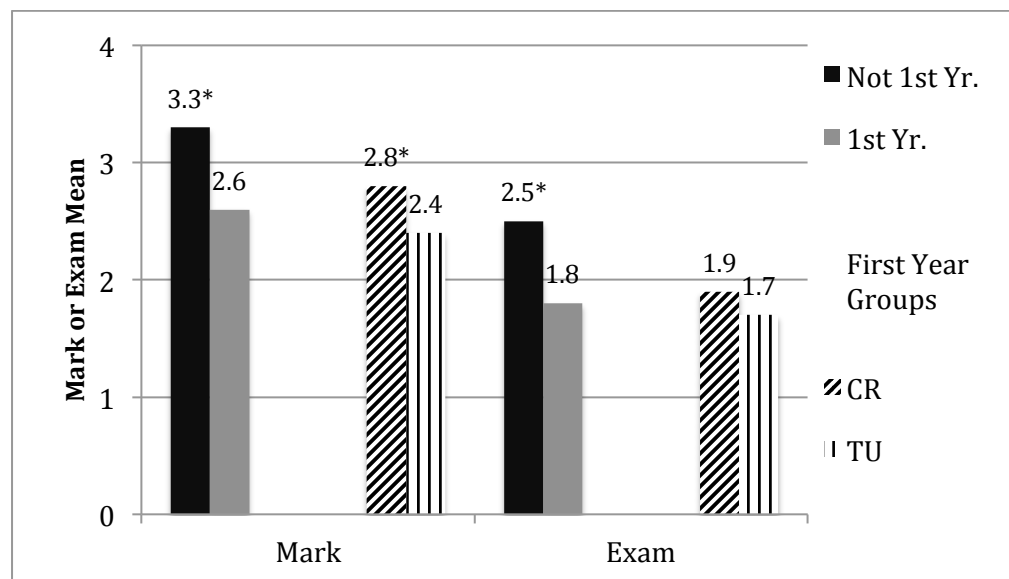


Figure 4. Means for marks in AP classes and AP exam scores for all AP students separated into first-year and not first-year, as well as first-year AP students divided into traditionally underrepresented (TU) and commonly represented (CR). $p < .01$

With increased enrollment for traditionally underrepresented students in AP classes, previous studies (Adelman, 2006; Attewell & Domina, 2008) cautioned about the potential to water down AP curriculum and inflate student marks. These concerns are unfounded in this study's findings. Based on the results of this study, a correlation exists for traditionally underrepresented students between the marks earned in the class and the score earned on the AP exam, $r = .34$, $p = .005$. However, it is a weak correlation with only 12% of the variance in the exam scores accounted for by the mark in the course. Since Farkas and Duffett (2009) found the AP exam score to be an effective safeguard to the quality of the AP course, then the presence of a correlation between the marks and the exam score, as in this study, shows the content is consistent with the expectations of the College Board panel that developed the course. This correlation serves as a baseline for the school in this study. To ensure that AP course content remains consistent with College Board's expectations, tracking changes in the strength and direction of the correlation between marks and exam scores is recommended.

AP class experience for first-year students. The second research question in the study focused on the experiences first-year AP students had within the AP classroom, specifically looking at the supports and challenges they identified. Contrary to Foust et al. (2009), where students who were new to AP found it difficult to break into the close community, this study found 80% of the first-year students felt welcome in the AP class, and felt they were part of the community in their AP class.

The teacher played a strong role in making first-year students feel that they belonged in the AP class. Of the first-year students, 78% said the ways they learned

and communicated were respected by their AP teachers, and 88% said their AP teacher believed that they could be successful in the AP class. These elements supported 80% of the first-year AP student's sense of being welcomed and part of the class community. This is in line with Faircloth (2009), who contended that the affirmation through the teacher and student relationship created a sense of belonging for the student. Also for first-year AP students, 80% of them perceived other students in the AP class made them feel welcomed. It is interesting to note that compared to their classes that were not AP, first-year AP students said they were treated more fairly by their peers in their AP class (90%) than in other classes (86%). Slightly more first-year AP students also identified sharing common interests and values with students in their AP class (76%) than they did in other classes (73%).

Even though first-year student responses indicated they generally felt a part of the community in their AP class (80%), they identified a need to prove themselves to their AP teacher (51%) and to other AP students (45%), displayed in Figure 5. As noted in Chapter 2, the development of a student's academic identity during adolescence focuses greatly on social connectedness and belonging (Faircloth, 2009; Mathews et al., 2014). Over half of the first-year AP students identified the need to prove themselves to their AP teacher. Fewer first-year AP students (36%) felt the pressure to prove themselves to teachers in other classes. A statistically significant difference ($p < .05$) existed between the need to prove themselves to their peers in their AP class (45%) and students in their other classes (32%). It is unclear if their perceived pressure to prove themselves motivated them to be successful or was an obstacle for them to overcome.

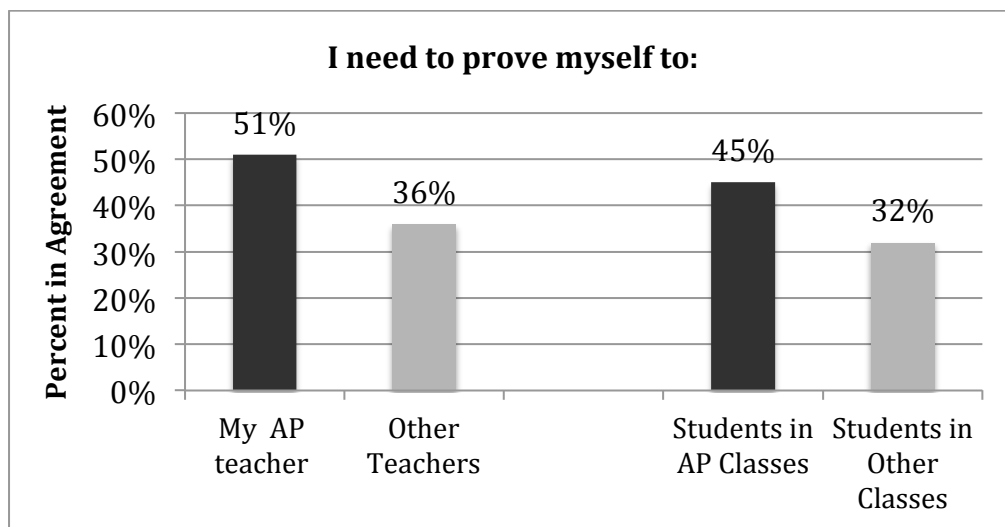


Figure 5. First-year AP student responses to the statement “Compared to my peers, I feel I have to prove myself to...”

When first-year students enroll in another AP course, their connectedness to the AP community increased, as noted by responses of students who were in their second or third year of AP coursework. These students felt they had more in common with their peers in their AP classes (94%) than they did with students in other classes (76%). However, the competition or need to prove themselves to their peers (72%) was still statistically significantly ($p = .03$) higher in their AP class than in other classes (62%).

AP students most frequently used words such as challenging, hard work, and interesting to describe what it felt like in AP classes compared to other classes. It could be inferred that the experience was more positive in AP classes, as shown by three times more positive descriptors (96) than negative descriptors (28). However, the negative descriptors provide a picture of the challenges some of these students faced with words such as stressful, time-consuming, and frustrating.

AP class experience for traditionally underrepresented students. Further examination of the first-year AP students was conducted by disaggregating the data by

the perceptions of traditionally underrepresented AP students and those of commonly represented AP students in order to address the study's third research question.

Interestingly, there were no statistically significant differences between these two groups in what they see as important to help them succeed in AP class.

Supports. Nearly all of the traditionally underrepresented students (95%) identified the same three elements as important to their success in AP class as did all of the first-year AP students: (a) the AP teacher helped them feel engaged and welcomed, (b) there was a greater variation in teaching strategies that met their learning needs, and (c) their AP teacher showed confidence in their ability to be successful in the class. These AP teacher characteristics were similar to those identified in Foust et al. (2009). The experience and preparedness of AP teachers noted by students in Foust et al. (2009) aligns closely with a teacher's ability to use a greater variation of teaching strategies to meet the needs of all students in the AP class found in the current study.

During the interviews two of the five students named the AP teacher as the biggest support to their success in the AP class. One student observed that unlike in her other classes, the AP teacher did not give an answer to a question, "she would make you work through it in your mind." Another student commented that the teacher really knew her students and pushed them to their potential. These perspectives of AP teachers knowing each student's abilities to help them succeed are in agreement with Kyburg et al. (2007), where the students trusted that their AP teachers would help them achieve success and were confident their AP teachers had the expert knowledge needed to prepare them to be successful in college.

A second support noted by 85% of the traditionally underrepresented AP students on the surveys, as well as during the interviews was that how they preferred to communicate and learn were respected in their AP class. According to responses in the interviews, the instructional strategies and activities in class, such as having students demonstrate an application of what they were learning, helped to strengthen their understanding of the difficult content. The third support that emerged in the interviews was collaboration with peers. Specific opportunities to collaborate such as group projects, class discussions, and study sessions were mentioned as helping them apply what they were learning.

Challenges. Findings from this study support earlier research on some of the barriers first-year traditionally underrepresented students face in AP classes. One such barrier is the pressure to excel (Foust et al., 2009). Consistent with other AP students, traditionally underrepresented students felt a need to prove themselves to their AP teachers (60%). This perceived pressure to prove they can be successful also extended to other students in the AP class (45%). For both traditionally underrepresented and commonly represented first-year AP students, there were statistically significant differences ($p = .03$ and $p = .01$) in their need to prove themselves to AP students compared to students from non-AP classes (see Figure 6.) In addition, 65% of the traditionally underrepresented AP students felt other AP students believed they were capable of succeeding in their AP class. In comparison, 85% agreed that their classmates in non-AP classes believed they were capable of succeeding in the class. Mathews et al. (2014) found a student's academic identity is formed partially through the external perceptions of others and partially through the internal self-concept. If

these traditionally underrepresented AP students interact with students who do not believe they can be successful, the identity forming could be a barrier to their success. These interactions could develop into the need to prove themselves to the other students in the AP class, however further research would be needed on this.

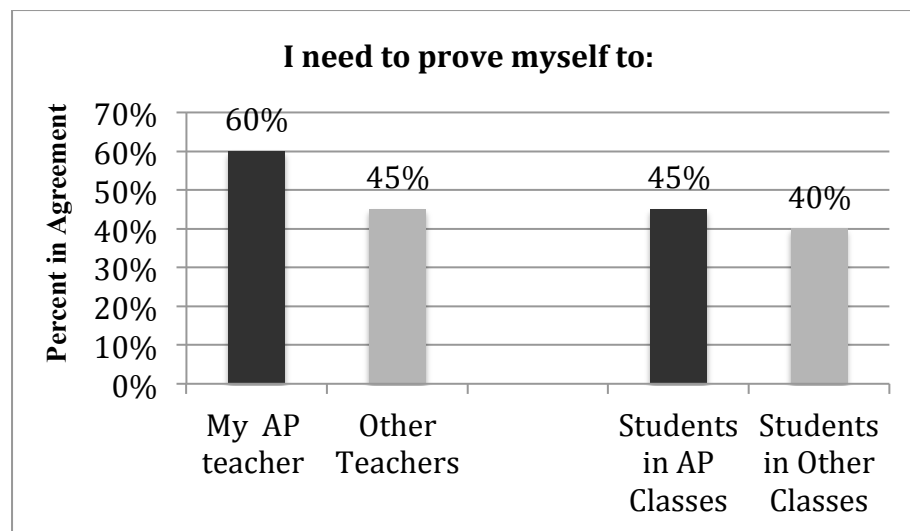


Figure 6. First-year traditionally underrepresented AP student responses to “Compared to my peers, I feel I have to prove myself to...”. There was a statistically significant difference between students in AP class and students in other classes, $p = .03$.

Even though more traditionally underrepresented students felt they were a part of the class community in their AP class (80%) than in other classes (75%), fewer of them were comfortable asking for help from their AP teacher (80%) than they were asking teachers in other classes for help (85%). Also, fewer traditionally underrepresented AP students were comfortable asking for help from other students in their AP class (70%) than students in other classes (75%). Since the percentages are so similar, it is unclear from this data if these students viewed the AP teacher or other students as supports or challenges.

The most common response from the student interviews when asked about the challenges they faced in the AP class was the struggle with managing their time. It was difficult for them to prioritize the heavy workload of an AP class and to block out enough study time to learn the difficult content. One student said she did not study outside of class in previous courses, so she did not know how to arrange her schedule to fit everything in outside of her AP class period. Another struggle they identified was their ability to take effective notes during class and use them as a study tool for tests and quizzes. Both of these challenges were highlighted as barriers in Foust et al. (2009). The third barrier noted in Foust et al. (2009), negative stereotypes of AP students by non-AP students, was non-existent in this study. When asked on the post-survey about the stereotypes of AP students at their school, 47% percent said there were more positive stereotypes and another 30% said there were an equal amount of positive and negative stereotypes of AP students. Only 5% of survey respondents said there were more negative stereotypes of AP students at the school.

Shifts in academic identity. The conceptual framework of Wenger's (1998) communities of practice theorizes that learning is not only something that is done in isolation and in a person's head, he also incorporates engagement, participation, and membership within the community to the learning process. Within a community of practice, a member is able to build his or her own identity, as well as help build the identity for the community as a whole. Matthews et al. (2014) also supported this construct by highlighting how a student's identity is formed through their internal perceptions as well as from the external feedback they receive from others about themselves. This current study analyzed student responses from before students

enrolled in an AP course to after they completed the AP class to examine if shifts occurred in their academic identity during the school year when they took their first AP class. A student's academic identity operationalized for this study was the combination of growth mindset, grit, academic self, and academic strategies.

Growth mindset. Students who believe that their intelligence is malleable, that it can grow with dedication and hard work, are said to have a growth mindset. Student responses on the pre-AP survey indicate first-year AP students had a strong growth mindset prior to enrolling in an AP class. Any changes in their belief of whether their intelligence was malleable or fixed are inconclusive from the post-AP survey responses. Two of the four questions demonstrated a slight shift towards a growth mindset, while one of the questions showed a slight shift towards a fixed mindset. There was no change on the fourth question from the pre-AP survey and the post-AP survey. Since these findings contradict each other, no conclusions can be made as to whether there was a clear change in how first-year AP students viewed their intelligence. Although, during an interview when asked about her academic skills after taking the AP course, one student indicated her skills had declined during the school year by stating, “the AP work made me feel a little stupid and it really discouraged me.”

Grit. Students who have the ability to sustain interest in and persevere towards long-term goals are said to have grit. Both the traditionally underrepresented and the commonly represented first-year AP students indicated statistically significant decreases on their agreement with the statement “I am a hard worker” ($p < .01$ and $p < .05$). One student summed this up well during her interview when she said she always

thought she was a good student in her other classes, but once she was in an AP class she found it difficult to meet all of the deadlines. In other words, what she had considered to be hard work in other classes was not sufficient in the AP class.

Academic self. Traditionally underrepresented students' perceptions had statistically significant decreases and moderate to strong effect sizes from the pre-AP survey to the post-AP survey for the three academic self indicators: (a) doing well in school ($p < .01$, $d = 1.07$), (b) getting good grades ($p < .01$, $d = 1.14$), and (c) understanding the materials in classes ($p < .05$, $d = 1.01$). Commonly represented students also saw decreases in all three areas, but only two of them were statistically significant: (a) doing well in school ($p < .05$, $d = 0.57$), and (b) getting good grades ($p < .05$, $d = 0.58$).

These decreases in the perceptions of "academic self" qualities for first-year AP students may be the result of many of them being recruited to enroll in an AP class based on their performance in other classes and teacher recommendations. Prior to enrolling in an AP class, these students had positive experiences making them feel they had strong academic skills and could learn what was being taught in class. These students were invited to enroll in AP because they were completing their assignments with high quality work and were achieving above most of the other students in their classes. To them and their families the grades they earned proved that they were doing well in school, even though they may have found the content easy to learn. Once they were in the AP class, they experienced a fast-paced program of study that challenged them. They were not able to consistently earn the grades they had in the past and felt they were not doing as well in school. This explanation is congruent with VanSciver's

(2006) research in which it was found minority students and students who came from poverty did not want to enroll in AP classes because they were focused on earning good grades rather than academically challenging themselves. Students in his study revealed that it was more important to bring home a report card with higher grades than it was for them to learn challenging content.

Academic strategies. Again, there were statistically significant decreases for each of the four statements measuring academic strategies with moderate to strong effect sizes for both groups of first-year students. The four academic strategies indicators were: (a) using my time wisely (TU = $p < .01$, $d = 0.93$; CR = $p < .01$, $d = 0.85$), (b) successfully handling problems that come my way (TU = $p < .01$, $d = 1.02$; CR = $p < .01$, $d = 0.71$), (c) coping well with distractions (TU = $p < .01$, $d = 1.01$; CR = $p < .01$, $d = 0.54$), and (d) working hard to achieve my goals (TU = $p < .01$, $d = 0.92$; CR = $p < .01$, $d = 0.69$). Traditionally underrepresented students had the largest mean decrease of 0.94 on a 6-point scale for “coping well with distractions.” Commonly represented students had the largest mean decrease of 0.91 for “using my time wisely.”

These decreases could be an indication of a systemic problem within the school and the school district. If students have had only limited exposure to long-term projects requiring perseverance, higher-level thinking, and an intense course of study, they may not have the academic strategies to succeed in an AP class. During the interviews students talked about the importance of time management and self-discipline for their AP coursework. “I never have had to really study before I took an AP class,” commented one student during an interview. Another said there was a big

difference in the workload for her AP class and her other classes. She said she had to be very organized in order to keep up with all of the due dates in her AP class.

Enrollment in another AP class. Over half of the first-year students said they planned to take another AP course, mostly for the challenge and to be prepared for college. Now that they have completed a year of an AP class, they have a better idea of what is expected. One student commented she now knows how to be prepared and would not spend the first half of the year trying to figure out how to study and learn the teacher's expectations. She will be able to focus on the learning rather than the organization.

When students were asked what would increase the likelihood of them enrolling in another AP course, the top response was they would want more study and homework support. This is consistent with Kyburg et al. (2007) where students wanted built in study groups that helped with content and academic language. Students also indicated the top reasons they did not want to enroll in another AP class were that they were worried it would hurt their GPA and they were not sure they could be successful. When asked if they would remain in another AP class if they were automatically enrolled, only 4% of the students responded that they would definitely drop the class. The largest percentage, 55%, said they might stay, and 41% said they would definitely stay enrolled. The reasons were not provided, but the responses may indicate students are open to this strategy.

Implications for Practice

The implications for practice do not only apply to AP classes and programs, but are systemic in the school system and need to be embedded throughout a child's K-12

education. Supports identified as important for first-year AP students were consistent for traditionally underrepresented and commonly represented students. AP teachers and school systems need not differentiate these recommendations since they would benefit most students. However, none of the recommendations that emerge from the results of this study are quick fixes and would need to be implemented and supported through ongoing teacher training that includes collaboration with their peers and time for reflection.

The first implication of this study is the need to increase the enrollment of traditionally underrepresented students in AP classes. The exposure to rigorous content, teaching strategies, and high expectations are not always experienced in general education classes, according to the responses to questions that compared AP classes to non-AP classes. One method used by the school in this study was to recruit students who have performed well in their other classes and were not already enrolled in an AP class. This proved to be an effective method to align the AP student demographics with demographics of the school. However, just increasing access of traditionally underrepresented students in AP classes does not necessarily mean they will thrive if they have not received adequate preparation in the skills necessary for success in an AP class.

The second recommendation is to increase the success of first-year AP students, both traditionally underrepresented and commonly represented. The most frequently identified support from this study for success in an AP class was the AP teachers' ability to share their beliefs that each student has the ability to succeed in

these AP teachers' classes. This is not only communicated verbally but also through feedback on student work and maintaining high expectations.

Another way to increase students' success is to create a learning environment where they feel engaged and welcomed in the AP class. As noted in this study, a student's identity is not only created internally, it is also formed by his or her perceptions of interactions with others. The tone established and maintained in the learning environment is critical to active student participation, learning, and growth. In combination with a supportive learning environment, increasing the skill set of teachers to meet the learning needs of a diverse group of students will support student success in not only AP classes, but other classes as well. These needed skills range from questioning strategies that require higher-order thinking to developing activities that require students to demonstrate an application of their new learning.

A fourth implication from this research is to increase the accessibility of extra study sessions and homework help for first-year AP students. On the post-AP survey the top reason students identified would make them more likely to take another AP class was if "I could get extra study/homework support." Also during the interviews students spoke of the opportunities they had to learn collaboratively during AP class as a support to their success. There are often study groups occurring during class, but students requested more opportunities outside of class time. These could even occur in an online environment in the evenings or on Saturdays.

Additionally, based on the decline in this study of first-year students' perceived academic self and academic strategies during the school year they were enrolled in an AP class, it is necessary to help students and their families understand the benefits of

exposure to and learning challenging content. According to the statistically significant decrease ($p < .01$) and strong effect size ($d = 0.92$) for student agreement to the statement “working hard to achieve my goal” from the pre-survey to the post-survey, traditionally underrepresented first-year AP students need more support in this area. Student goal setting that provides an emphasis on the learning that is happening and the growth being made should be the focus rather than the grade earned in the class.

Finally, the greatest implication to help first-time AP students overcome the challenges they experience in AP classes is to begin developing time management, note taking, and study skills earlier in students’ educational years. It is difficult for first-year AP students both to develop the needed study skills and to apply these skills to rigorous content simultaneously. Helping all students learn how to take high-quality notes to be used effectively as a tool when studying should happen prior to entering high school. In conjunction with this, as early as the elementary grades, opportunities should be provided where students need to develop time management skills by prioritizing tasks and mapping out long-term projects (Theokas & Saaris, 2013).

Limitations of the Study

There were a number of limitations that were inherent to the design of this study. These limitations limit the broad generalizability of this work.

One of the limitations of this study was the size of the sample. While there were 270 AP students in the 11th and 12th grades in this high school, only 81 of them chose to complete the post-AP survey. This sample size of 30% of the participants limits the ability to generalize the findings in this study. In addition to the small percentage of respondents to the survey, the number of interview participants was

small. Potential students to interview were limited to 16 because they needed to have taken an AP class for the first time the previous year, be still enrolled at the high school, and belong to the traditionally underrepresented subgroup. Multiple efforts were made to receive parental permission for students to participate in the interviews, but only five students returned their signed permission forms. It is possible the 11 students not interviewed would have different opinions. The sample was also from one school in one district in the Northwestern United States. The inclusion of students from AP programs in other high school may have resulted in different findings.

Another limitation in the study was that the survey and interviews were self-reporting instruments. The findings of the study are meaningful only to the extent that the participants are honest when expressing their attitudes and beliefs. With any self-reporting instrument, there is potential for the existence of a response set, commonly occurring as individuals selecting responses that are believed to be the most socially acceptable, even if they are not truthful for the participant (Mills & Gay, 2015). Having participants respond to the survey anonymously could have offset this, but then a new limitation would arise in not being able to triangulate by connecting the survey data to the achievement data and interviews.

Another inherent limitation within this study is the instrument reliability of the pre-AP and post-AP surveys. The pre-AP survey has been used by high schools to identify students who have potential to be successful in AP classes. However, no reliability data was available. The post-AP survey items mirrored portions of the pre-AP survey in order to measure growth. Also, many of the survey items had 5- or 6-

point Likert-type scale responses. The means used for comparison and the *t*-tests used to identify statistical significance are limited with ordinal data.

Another potential limitation has to do with a threat to the internal validity of the study. Since the span of time between the pre-survey and the post-survey was 18 months, the specific events that occurred between the surveys may have affected how the students responded. The researcher would not be able to assert conclusively that the changes found in the students' perceptions of their academic identities were due to their participation in an AP course.

Implications for Future Research

The goal of this work was to expand understanding of the perceptions of first-year AP students and traditionally underrepresented AP students, specifically investigating the supports and challenges they faced, and whether there was a shift in first-year AP students' and traditionally underrepresented AP students' academic identity during the year they were enrolled in an AP class. Of the conclusions identified in this study, the biggest surprise was the reported need for many first-year AP students to prove themselves to their teacher and peers in their AP classes. Further research is warranted in this area to identify why students felt this need and how it affected their ability to learn in AP classes. In particular, was it a motivating factor to succeed, or did it function as a challenge that interfered with the students' learning? Similarly, future research is needed on first-year and traditionally underrepresented student perspectives of the balance between feeling welcomed in an AP class and the pressure they placed on themselves to show their teacher and peers they can be successful in the AP class.

Additionally, it would be interesting to see if the decline in first-year traditionally underrepresented student perceptions of their “academic self” indicators, and “academic strategies” indicators continues as student enroll in future AP courses. With a larger sample size, an experimental study with an intervention group and control group could be conducted to see which strategies bolster student perceptions in these areas.

Also, this study did not disaggregate the student performance or student survey responses by the specific AP courses. Instead it analyzed student performance and response to AP courses in general. Future research is warranted by disaggregating the results by AP course, showing which courses students were more successful in and which were more challenging. Conducting this research across multiple schools and districts to increase the sample size would reduce the effect of the teacher.

Another area for future research is to mirror this study with a larger sample size of students, both for the pre- and post-AP survey as well as with conducting student interviews. If the sample size included more diversity as well as a school setting that was not suburban, the generalizability of the findings would be broader.

Conclusion

Given the documented persistent achievement gap across our country, it is evident we are not equitably serving all of our students. Increasing the frequency of exposure to rigorous content, such as that in AP courses, for students of color and students who come from lower socioeconomic families, is one way to shrink the equity gap that exists in graduation rates and rates of enrollment in college. To achieve more equitable educational opportunities and outcomes for students, students should be

identified who have demonstrated skills that potentially can lead to success in AP classes and encourage them to enroll (College Board, 2014). Enrollment in the AP program can be increased for traditionally underrepresented students by clear communication by adults at the school about the benefits of participating in AP courses. This communication should be available to all students, but specifically to traditionally underrepresented students and their families who do not know to advocate for their child to be enrolled in an AP course (VanSciver, 2006).

Increasing the percentage of traditionally underrepresented students to match the demographics of the school is the beginning. Once traditionally underrepresented students are enrolled in an AP class, implementing this study's identified supports and assisting them through the identified challenges will increase student success.

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Appendix A

Post-AP Survey

We want to better understand your participation in classes, particularly your Advanced Placement classes. Many of the questions are similar to a survey that you participated in during November 2014. Your answers on this survey will be anonymous to school staff and will be used at the district level to look for patterns and trends. Please answer each question openly and honestly.

1. Student ID Number _____

2. What grade are you in this year? 9th 10th 11th 12th

3. I have a certain amount of intelligence and I can't do very much to change it.
 Strongly Disagree 1 2 3 4 5 6 Strongly Agree

4. It's possible not just to learn more, but to get smarter as well.
 Strongly Disagree 1 2 3 4 5 6 Strongly Agree

5. I am a hard worker.
 Strongly Disagree 1 2 3 4 5 6 Strongly Agree

6. I am discouraged by hardships.
 Strongly Disagree 1 2 3 4 5 6 Strongly Agree

7. I finish whatever I begin.
 Strongly Disagree 1 2 3 4 5 6 Strongly Agree

8. Which of the following statements best describes you? Please choose only one.
 - I figure out whatever it takes to get good grades.
 - I appreciate learning for learning's sake.
 - Getting the best grade is less important than feeling confident about what I've learned and how hard I've worked.
 - I have found a subject that I'm really interested in learning about and focus my energy on that.
 - I am not really into high school.
 - I have other priorities outside of school.
 - I've struggled with school in the past but know I can do better.
 - My grades don't reflect my full potential.
 - None of these statements describes me well.

9. Please explain your answer to the previous question. (If you identified with more than one statement, please explain here.)

10. How challenging are your classes?

- Very easy
- Easy
- Somewhat easy
- Somewhat challenging
- Challenging
- Very challenging

How likely is it that the following statements describe you this year?

11. Doing well in school

Very Unlikely 1 2 3 4 5 6 Very Likely

12. Getting good grades

Very Unlikely 1 2 3 4 5 6 Very Likely

13. Understand the material in my classes

Very Unlikely 1 2 3 4 5 6 Very Likely

14. Using my time wisely

Very Unlikely 1 2 3 4 5 6 Very Likely

15. Successfully handling problems that come my way

Very Unlikely 1 2 3 4 5 6 Very Likely

16. Coping well with distractions

Very Unlikely 1 2 3 4 5 6 Very Likely

17. Working hard to achieve my goals

Very Unlikely 1 2 3 4 5 6 Very Likely

18. What is your highest educational goal?
- High school diploma
 - Vocational certificate (two-year)
 - Associate's degree (two-year)
 - College degree (four-year)
 - Advanced degree (master's, doctorate, or other)
19. Do you feel like your classes are preparing you for two- or four-year college?
- Definitely not
 - Probably not
 - Unsure
 - Probably yes
 - Definitely yes
20. Do your parents or guardians expect you to graduate from college?
- Definitely not
 - Probably not
 - Unsure
 - Probably yes
 - Definitely yes

Please state your level of agreement with the following statements:

21. I can learn new things, but I can't really change how smart I am.
- Strongly Disagree 1 2 3 4 5 6 Strongly Agree
22. No matter how much intelligence you have, you can always change it quite a bit.
- Strongly Disagree 1 2 3 4 5 6 Strongly Agree
23. New ideas and projects sometimes distract me from previous ones.
- Strongly Disagree 1 2 3 4 5 6 Strongly Agree
24. I often set a goal but later choose to pursue a different goal instead.
- Strongly Disagree 1 2 3 4 5 6 Strongly Agree
25. Is this your first year you have taken an AP class?
- Yes
 - No
26. Have you taken at least one Honors Courses previously?
- Yes
 - No

27. Are you planning to take another AP course?

- Yes
 No
 Unsure

28. Please explain your answer to the previous question about taking another AP course.

29. If you were automatically enrolled in an AP class due to your test scores, grades, and/or teacher recommendations, would you choose to remain in the AP class or would you drop the class?

- I would remain in the AP class.
 I would drop the AP class.
 I might decide to stay in the class, but would need more information before choosing to do so.

30. What most influenced you to enroll in your first AP class?

- One-on-one conversation with a school staff member
 A school assembly
 A letter home
 A conversation with my parents or guardians
 An announcement at school
 A college or AP night
 Classroom visit from a counselor or other school staff member
 A meeting with my counselor
 A student group presentation
 A conversation with a friend
 I've planned to take AP before starting high school
 It's just part of the school culture to take AP
 Other: _____

31. Are stereotypes about students who take AP more positive or more negative at your school?

- More negative
 Equally positive and negative
 More positive
 I don't know of any stereotypes about AP students

32. How frequently have the following people encouraged you to take an AP class?
Mark only one per row.

	Never	Once	A few times	Lots of times
Friend or Classmate				
A school staff member				
A parent or guardian				
Sibling or relative				

33. Please answer the following question about AP: *Mark only one per row.*

	Yes	No	Unsure
Do AP classes boost students' chances of getting into college?			
Do AP classes prepare students to do better once they are in college?			
Do AP classes help students earn college credit?			
Are AP classes designed exclusively for students who are planning to go to top four-year colleges?			

Please indicate your level of agreement with the following statements:

34. The staff at my school have provided me with enough information about the AP program.

Strongly Disagree 1 2 3 4 5 6 Strongly Agree

35. Students like me are welcomed in AP classes.

Strongly Disagree 1 2 3 4 5 6 Strongly Agree

36. Please select the top reasons (up to 3) why you would choose NOT to take an AP class in the future. **Check all that apply.**

- I think AP classes are too much work.
- I don't think I can be successful/get a good grade.
- I am not sure I would have classmates to study with or partner with for projects.
- I am not sure I could get the help (with study skills, homework assignments, etc.) I need to be successful.
- I am worried it might hurt my GPA.
- I don't know teachers who teach AP.
- I don't think I've taken the right courses to qualify for another AP class.
- I have competing priorities in my schedule (for example: sports, band, CTE) that prevent me from taking AP classes.
- I don't know if AP classes are worth my time.
- Other: _____

37. I would be more likely to take another AP class if: *(Please select up to 3 top reasons)*

- I would receive special recognition at graduation.
- I knew that I would have classmates to study with or partner with for projects.
- I could get extra study/homework support.
- I could participate in a summer program to help prepare me for AP.
- I knew my class materials and AP exam fee would be paid for.
- I could have transportation to/from school outside of normal school hours.
- I would have access to help from students who took the AP class before.
- I knew that I wouldn't have any homework over the summer.
- I knew that there were optional study skills trainings (e.g., working on time management, organization skills, etc.).
- I'm graduating this year, so I won't be taking AP classes next year.
- Other: _____

In general, how important do you think it is to start AP classes with the following skills and dispositions?

38. To not give up even when something is hard

Not important at all 1 2 3 4 5 6 Very important

39. Self-discipline

Not important at all 1 2 3 4 5 6 Very important

40. Awareness of my own learning

Not important at all 1 2 3 4 5 6 Very important

41. Time management

Not important at all 1 2 3 4 5 6 Very important

42. Planning and goal setting

Not important at all 1 2 3 4 5 6 Very important

43. How important do you think each of the following items are in helping you succeed in AP classes? Mark only one per row.

	Not important at all	Not very important	Somewhat important	Very Important	Unsure
Adults at your school helped you feel engaged and welcomed in AP classes.					
Adults at your school connected your parents, family and/or culture with your learning in AP classes.					
Adults at your school provided a greater variety of teaching supports and strategies to fit your learning style in AP classes.					
Adults in AP classes showed you that they believe in you.					

We are interested in finding out more about how it feels to be in AP classes. To what extent do you agree with the following statements as related to your experience in AP classes?

44. I feel like a part of a community in class.

Strongly Disagree 1 2 3 4 5 6 Strongly Agree

45. The ways I prefer to communicate and learn are respected.

Strongly Disagree 1 2 3 4 5 6 Strongly Agree

46. I am comfortable asking for help from AP teachers when I need it.

Strongly Disagree 1 2 3 4 5 6 Strongly Agree

47. Compared to my peers, I feel like I have to prove myself to AP teachers.

Strongly Disagree 1 2 3 4 5 6 Strongly Agree

48. My AP teachers believe that I am capable of succeeding in class.

Strongly Disagree 1 2 3 4 5 6 Strongly Agree

49. I am comfortable asking for help from other AP students when I need it.

Strongly Disagree 1 2 3 4 5 6 Strongly Agree

50. Compared to my peers, I feel like I have to prove myself to other AP students.

Strongly Disagree 1 2 3 4 5 6 Strongly Agree

51. Students in my AP classes believe that I am capable of succeeding in class.

Strongly Disagree 1 2 3 4 5 6 Strongly Agree

52. Students like me (e.g. my race, my gender) are treated fairly by other AP students.

Strongly Disagree 1 2 3 4 5 6 Strongly Agree

53. I share some common interests and values with other AP students.

Strongly Disagree 1 2 3 4 5 6 Strongly Agree

54. Other students make me feel welcome in AP classes.

Strongly Disagree 1 2 3 4 5 6 Strongly Agree

We are interested in finding out more about how it feels to be in classes that are not AP. To what extent do you agree with the following statements as related to your experience in other classes?

55. I feel like a part of a community in class.

Strongly Disagree 1 2 3 4 5 6 Strongly Agree

56. I am comfortable asking for help from my teachers when I need it.

Strongly Disagree 1 2 3 4 5 6 Strongly Agree

57. Compared to my peers, I feel like I have to prove myself to teachers.

Strongly Disagree 1 2 3 4 5 6 Strongly Agree

58. My teachers believe that I am capable of success.

Strongly Disagree 1 2 3 4 5 6 Strongly Agree

59. Students like me (e.g., my race, my gender) are treated fairly by adults in classes.

Strongly Disagree 1 2 3 4 5 6 Strongly Agree

60. I am comfortable asking for help from other students when I need it.

Strongly Disagree 1 2 3 4 5 6 Strongly Agree

61. Compared to my peers, I feel like I have to prove myself to other students.

Strongly Disagree 1 2 3 4 5 6 Strongly Agree

62. Students in my classes believe that I am capable of succeeding in class.

Strongly Disagree 1 2 3 4 5 6 Strongly Agree

63. Students like me (e.g., my race, my gender) are treated fairly by other students.

Strongly Disagree 1 2 3 4 5 6 Strongly Agree

64. I share some common interests and values with other students.

Strongly Disagree 1 2 3 4 5 6 Strongly Agree

65. Please enter three words that best describe what it feels like to be in an AP class compared to other classes you have taken at your school.